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CONTENTS.

An Asterisk (*) denotes an illustrated article.

EDITORIALS—

The Chicago Meeting of the Western Gas Association..... 281

All Hail to President Newman..... 282

Eighth Annual Meeting of the Western Gas Association—Official Report..... 283

First Day, Morning Session—Roll-Call—Reading of Minutes—President's Address—Committee on President's Address—New Members—Committee on Obituary Resolutions—Welcoming the Visitors—Committee on Nomination of Officers.

Papers Read before the First Annual Meeting of the Ohio Gas Light Association, with Discussions on Same—Official Report—Concluded from page 262..... 285

Discussion on "What is the loss in weight of coal from a storage of six months, or the difference between weights of coal when put into coal house and charged into retorts?"—Second Day, Morning Session—How can the Form of the Retort, or the Manner of Setting the Same, be Improved? by Mr. J. Anderson—Discussion—Adjournment.

The Effect of Carbonic Acid on the Illuminating Power of Coal Gas, by C. J. R. Humphreys..... 288

*The Bower Recuperative Burner..... 289

Special English Correspondence..... 290

ITEMS OF INTEREST FROM VARIOUS LOCALITIES..... 291

Mister Gibbs "Gets Left"—The Death Roll—Case No. 1 Looks Like a Suicide—Case No. 2—Our English Contemporary Thinks So Too—Trumping up Charges of Labor Troubles—Certainly; Why Not?—How a Reverend Gentleman Looks upon Different Lights—More Investigations—The Cost of Operating a Gas Assaying Furnace—Nominating an Inspector of Gas Meters—How they Trust One Another—Striving for an Increased Summer Consumption—Montgomery (Ala.) to do Likewise—Gas Turned on at Los Gatos, Cal.—Waiting for the Improved Machines—No Electric Light for Poughkeepsie, N. Y.—Is it a Job?—Station Meter Blown Up—Gas War at Austin, Texas.

The Market for Gas Securities..... 293

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND CLASS MATTER.

THE CHICAGO MEETING OF THE WESTERN GAS ASSOCIATION.

The Western Gas Association celebrated its eighth annual birthday, in right royal style, at the Tremont House, Chicago, Ills., on the 13th, 14th and 15th days of last month. It was anticipated that a right good rousing anniversary would be the result of Secretary Littleton's earnest attention to the preliminary work of the gathering; but when President Lansden rapped for order on the morning of the 13th, and announced that everything was in readiness for the transaction of business, the grand attendance of honest, earnest men was such as to make the speculatively inclined open wide their eyes in wonderment while revolving within themselves the question as to what proportions might be attained by this Western Gas Association within the next decade. Let the dwellers in the East (or rather let those so inclined refuse to see) look upon it as they will, the Westerner is the coming man—he is resolute unto aggressiveness, and knows no such thing as turning back. But as this is scarcely the proper time or place to discuss the "coming man," we will dismiss the matter and return to the subject in hand.

To show with what *eclat* the arrival of the visitors was ushered in, we might mention that on the evening of the 12th, at an hour when almost every train that entered Chicago was contributing its quota of living freight, in the shape of gas men, to the hospitable embraces of the "Gotham of the West," the weather clerk had provided a sort of impromptu reception in the shape of a smart thunder shower; and to keep along with a description of the after weather conditions during the days of the sessions, the word perfect best describes them. To some, perhaps, it may have appeared as though the mercury were over-anxious to mount the scale; but to us from the East, and particularly so with those from localities not far removed from the Atlantic coast line, the first ardors of old Sol's rays are sure to be appreciated.

It will be remembered that about the only thing in the nature of a drawback to complete enjoyment of the proceedings at the St. Louis meeting of the year previous was the poor acoustic property of the hall or parlor in the Southern Hotel in which the sessions were held. With that experience in view, the Local Committee of Arrangements for the present year saw to it well that a like complaint should not be heard in 1885; nor was it sounded. The Tremont House answered most admirably in every respect, and too much praise cannot be awarded the proprietor of that elegant and commodious caravansary for his solicitude in attending to the wants, as well as in his untiring ministrations to the comforts of his guests.

As said before, the attendance was grand, and everybody was immensely pleased thereat. Lansden, brisk as ever, bubbled over in smiles, and genial Gus Littleton fairly hugged himself in congratulation. The local committee were as active as crickets—indeed they seemed to have become for the time almost ubiquitous. When the Chairman had fairly started the business in, and no time was wasted in preliminaries, with the reading of his annual message, everything progressed smoothly and rapidly. In his address Mr. Lansden departed somewhat from the usual style of handling the matters generally contained in such documents; and, take it all in all, we think he did rather wisely. He spoke his mind in a thoroughly common-sense way, and put things forward in a nice congruity. We do not propose to discuss at length the topics descanted on by him; and, indeed, had we the mind to do so, the action of the committee appointed by the Association to consider the same lifts the subject proper from the sphere of legitimate criticism. How-

ever, we cannot forbear noting one or two points. Mr. Lansden sounds the true metal when he invites those in charge of the smaller works to "come to the front" with the recital of their experiences in manufacture. These are the very men whose daily practice affords most valuable ground for future progress in the larger plants. Your "big company" is not complete without its experimental fitting. Right next we beg to disagree with Brother L.; and must submit that we incline to the view that he is woefully out in the way of his estimate with what he calls the "science of gas manufacturing." Science and practice must go hand-in-hand in any business that is in any manner allied to the twin sisters, chemistry and physics, if the full measure of success is to be realized. We cannot think that Mr. Lansden means to be taken literally in his statement, "I would not exchange one month's practical experience for fifty years of delving into the science of gas manufacturing."

But, to forbear from any further notice of this single point wherein we differ with Mr. Lansden's statements, we think it must have been with a keen appreciation of the humor of the situation that Mr. Lansden listened to the president of that small company, when the latter put himself on record as believing that "your gas associations are all a humbug. * * * No two of you could agree on anything." We sorrow with Mr. L. that the "small president's" superintendent was not present at the meeting, and further believe that the "small company" would be better served if that president (we have not the slightest idea who he is) handed in his resignation. That portion of the address relating to the topic of gas meters we commend most heartily to the tender consideration of "our own dear Mr. Sherwood" and his brother agitators. Chairman Lansden welcomed to the banded ranks the Ohio and Iowa State Associations, and with good foresight hopes that the other States will follow in the practice. May we hope Mr. L. will see to it that initiatory steps will soon be taken in Missouri? It is in the formation of these State bodies that proper legislation in regard to control of the gas business may be best effected. Mr. Lansden's tribute to the memory of Mr. Butterworth is the offering of a kindly heart, and does but simple justice to the honor and manliness of the Association's dead ex-president. We must confess that Mr. Lansden's announcement of the demise of associate-member, Mr. George Downing, of New York city, was news to us. He was a genial, generous man, and one whose absence from the ranks cannot fail to be sincerely regretted.

Mr. Lansden's address will be found reproduced on pp. 283–4 of this issue, and the manager of every small gas works in this country will find it worth many a bright dollar to him if he will but study it closely.

Littleton had his hands full all through the first day's session in attending to the applications for membership, and by the time the list was tallied up the roll had been increased by 36. His annual report of state of finances shows a healthy state of the Western's treasury. The invitation to accept of the hospitalities of the Association was neither a "delusion nor a snare." Among the Eastern visitors were noticed Harbison, of Hartford, Conn., looking just as straight and sturdy as though no such a thing as pneumonia had ever existed; Slater, of Providence, R. I., clothed with his usual charming urbanity; Cap. White (cannot name a place of precise abode for him), with that Roman collar unspotted and unsmirched—it was yet early in the proceedings, though; Harry E. Floyd, of New York city, scholarly and prim; L. P. Gerould, of Manchester, N. H., confident and smiling; and J. H. Walker, of Rochester, N. Y., calm, placid and unruffled. There were other Yankees present, and many of them, too; but as they answered to roll-call in the regular way, why, it was their bounden duty to be present. In the name of these gentlemen, and also speaking for ourselves, we cannot too warmly thank our hosts for their gratifying attention, made so heartily manifest on every possible occasion. Truly, did Littleton know whereof he spoke when he promised that those who accepted of the Association's summons to hospitality would find the latchstring in its proper place. The latchstring was there, and the most hospitable of hosts were behind it.

Three sessions were held on the 13th at morning, afternoon and evening; and on the 14th sessions took place at morning and afternoon. The papers read and discussed were the following: "On the Pressure of Gas in the Mains," by Mr. G. A. Hyde, of Cleveland, Ohio; "The Steam-jet Exhauster and Naphthaline," by Ex-president J. B. Howard, of Dubuque, Iowa; "The Proper Location of the Gas Meter," by Mr. J. G. Miller, of Green Bay, Mich.; "Utilization of Waste Heat," by Mr. J. W. Dunbar, of New Albany, Ind.; "Iron Purifying Material," by Mr. E. H. Jenkins, of Columbus, Ga.; "Stoppages in Small Gas Works," by Mr. V. L. Elbert, of Jackson, Mich.; "Success in the Gas Business," by Mr. Wm. E. Lindsley, of Cleveland, Ohio; "Gas Bills *vs.* Gas Light," by Mr. B. E. Chollar, of Topeka, Kan.; and the "Cooper Coal Liming Process," by Mr. G. S. Page, of New York city. Between time of reading the 6th and 7th papers, at the suggestion of President Lansden, the question-box (which had previously been placed in position) was opened, and the queries taken therefrom were discussed. It may well be imagined that a proper digestion of the papers presented made dalliance or delay impossible; and in order to clear up the decks so that the programme might be made in readiness for the banquet, which was to be discussed at 8 P.M., of the 14th, the members adhered closely to their work. In fact it was one continual scene of "hammering right along." Lansden, Littleton, and that spry and really clever "gas man from Columbus"—Emerson McMillin—aided much towards the accomplishment of the "regular order" by their parliamentary tact and skill.

The Association chose as officers for the ensuing year the following-named gentlemen:

President—Mr. James Somerville, Indianapolis, Ind.
First Vice-President—Mr. John Fullagar, Cincinnati, Ohio.
Second Vice-President—Prof. S. H. Douglas, Ann Arbor, Mich.
Secretary and Treasurer—Mr. A. W. Littleton, Quincy, Ills.
Directors—Messrs. E. H. Jenkins, G. A. Hyde, Jr., W. Wallace, S. Prichitt, T. A. Cosgrove, W. H. Odiorne, T. G. Foster, and J. Montgomery.

Before taking leave of this portion of the subject we cannot help once more reverting to Secretary Littleton's faithfulness in his official duties in connection with the Secretaryship of the Western Association; and this persistence is all the more praiseworthy when it is borne in mind that he had been all but prostrated from the weariness attendant upon one who for weeks has been battling with an enemy that threatened the abrupt severance of those domestic ties which man holds most dear to his heart. The verdict of the Western Association, along with our own, is, May Littleton's apprenticeship to trouble soon be but a memory of the past.

At 8 o'clock on the evening of the 14th the members sat down to the enjoyment of a right regal banquet, provided for their entertainment at the instance of the various manufacturing houses, connected with or allied to the gas industry, either doing business directly from, or having agencies in, the city of Chicago. Among the subscribers to the banqueting arrangements, we may, without any invidious appearance, mention the name of the Chicago Gas Light and Coke Company. The main dining room had been in a short space of time transformed into a most charming banqueting hall. The tables were arranged in tasteful parallel rows, with a cross-table at head of the three columns, and at the cross-table were gathered the dignitaries of the feast. The bill of fare was well selected, the viands choice, and the liquids rare. The speeches were sparkling with wit and humor, and President Lansden acquitted himself nobly. Everything went off without a flaw (this applies to the wine, too), and entire success attended the banquet from the time "grace was said" until the assemblage adjourned, with every one sounding the praises of the Local Committee of Arrangements and their co-adjutors, the Manufacturers Committee on Banquet.

On the 15th, which was devoted to sightseeing, a most commendable plan was pursued. Carriages conveyed the members to the Post Office building, where a photographer was in readiness to take a picture of the "gathered clansmen." This done, the occupants of the different carriages gave orders to their drivers to convey them to such points as it was desired to visit. Some went to the different gas works, and others (those who were not well acquainted with the city) preferred to inspect the many gorgeous buildings which grace the Western Gotham. Taken as a whole, it was a most pleasurable and untrammeled way of "doing a sightseeing trip." The 15th of May, with all its pleasures, ending with the hour for train-time home, parting adieus were spoken, and the Eighth Annual Meeting of the Western Gas Association was ready for inscription on the records. It is needless to add that these records will appear as usual in the columns of the JOURNAL.

ALL HAIL TO PRESIDENT NEWMAN.

In our "Market for Gas Securities" in last issue we stated that Mr. R. J. Lackland, of the St. Louis (Mo.) Gas Light Company, had refused to continue negotiations with the representatives of the United Gas Improvement Company, of Philadelphia, who sought to obtain control of the St. Louis Company by purchasing a certain number of shares in that corporation at the figure of $315 for each fifty-dollar share (St. Louis shares are "half-stock"), and allowing the former holders to divide among themselves a sum of money, equivalent to $85 per share, due the Company; in other words, the "Imp." Company offered $400 for each $50 share. The Philadelphia people either could not or would not (probably the former) stick to their bargain; and now comes the best part of the thing. Mr. Socrates Newman, who (with his friends) is largely interested in the St. Louis Company, said to Mr. Lackland and his friends: "I will give you $400 a share for your stock." The offer was accepted, the transfer was made, and Mr. Newman was elected to the Presidency; Mr. C. C. Maffit took Mr. G. B. Allen's place as Vice-President; and Mr. Scullin succeeds Judge Madill in the Directorate. This is a triumph for honest management and cheaper gas in the old St. Louis district, as Mr. Newman is a progressive man, and has no intention of keeping up the dog-in-the-manger policy that has so long prevailed in that city. Mr. Geo. S. Page, of New York city, had a "finger in this pie." Our next issue will, if possible, contain an account of the St. Louis affair.

[Official Report.]

Eighth Annual Meeting of the Western Gas Association.

Held at the Tremont House, Chicago, Ills., May 13, 14, and 15, 1885.

First Day—Morning Session—May 13.

The Eighth Annual Meeting of the members of the Western Gas Association, in accordance with the call of the Secretary, was held at the Tremont House, Chicago, Ills., on the 13th, 14th, and 15th days of May. The Convention was called to order at 10 o'clock on the morning of May 13th by the President, Mr. Thomas G. Lansden, of St. Louis, Mo. Mr. A. W. Littleton, of Quincy, Ills., occupied the Secretary's desk.

Roll Call.

A call of the roll showed the presence of the following members:

Honorary Member.

Joseph R. Thomas, Brooklyn, N. Y.

Active Members.

Agard, W. A., Des Moines, Iowa.	Barret, A. H. Louisville, Ky.
Baxter, Jr., A. C., Lima, Ohio.	Belden, C. W., Chicago, Ills.
Bellmer, W. E., Carlinville, Ohio.	Brown, Edwin Lee, Chicago, Ills.
Butman, J. W., Decatur, Ills.	Canby, R. H., Bellefontaine, Ohio.
Chollar, Byron E., Topeka, Kansas.	Clarke, Harry E., Kansas City, Mo.
Collins, Carroll, Murfreesboro, Tenn.	Cosgrove, Thos. A., Evanston, Ills.
Coverdale, R. T., Cincinnati, Ohio.	Cressler, A. D., Fort Wayne, Ind.
Daniels, James, St. Louis, Mo.	Davis, Daniel, Iowa City, Iowa.
Decker, J. H., Hannibal, Mo.	Dell, John, St. Louis, Mo.
Dickey, C. H., Baltimore, Md.	Douglas, S. H., Ann Arbor, Mich.
Down, W. H., New York, N. Y.	Dunbar. J. W., New Albany, Ind.
Elbert, V. L., Jackson, Mich.	Fullagar, John, Cincinnati, Ohio.
Gerould, H. T., Mendota, Ills.	Foster, T. G., Montgomery, Ala.
Goodwin, W. W., Philadelphia, Pa.	Gimper, John, Leavenworth, Kansas.
Griffin, J. J., Philadelphia, Pa.	Green, James, St. Louis, Mo.
Harris, J. A., Philadelphia, Pa.	Harris, G. S., Mansfield, Ohio.
Hauk, Chas. D., Springfield, Ohio.	Haselmeyer, A., Springfield, Ills.
Hicks, Geo. C., Chicago, Ills.	Henning, D., Chicago, Ills.
Howard, J. B., Dubuque, Iowa.	Howard, E. T., St. Louis, Mo.
Humphrey, R. C., Ashtabula, Ohio.	Howden, J. J., Muskegon, Mich.
Hyde, Jr., G. A., East Saginaw, Mich.	Hyde, G. A., Cleveland, Ohio.
Keller, C. M., Columbus, Ind.	Jones, N. W., Chicago, Ills.
King, E. J., Jacksonville, Ills.	Kennedy, J. M., Rockford, Ills.
Lansden, T. G., St. Louis, Mo.	Knight, C. S., Fort Wayne, Ind.
Lindsley, Edward, Cleveland, Ohio.	Light, Joseph, Dayton, Ohio.
McDonald, W., Albany, N. Y.	Littleton, Aug. W., Quincy, Ills.
McMillin, E., Columbus, Ohio.	McIlhenny, John, Philadelphia, Pa.
Mitchell, J. K., Galesburg, Ills.	Miller, J. G., Green Bay, Wis.
Moran, Michael, Joliet, Ills.	Montgomery, James, Sedalia, Mo.
Morse, E. W., Fort Scott, Kansas.	Morgans, W. H., Pontiac, Mich.
Nash, C. H., St. Joseph, Mo.	Murdock, G. T., Elkhart, Ind.
Page, Geo. S., New York, N. Y.	Odiorne, W. H., Springfield, Ills.
Pratt, Henry, Chicago, Ills.	Perkins, B. W., South Bend, Ind.
Printz, Eugene, Zanesville, Ohio.	Prentice, Allen T., Chicago, Ills.
Ramsdell, G. G., Vincennes, Ind.	Prichitt, Samuel, Nashville, Tenn.
Ritchie, W. C., St. Louis, Mo.	Raynor, C. H., Adrian, Mich.
Runner, Z. T. F., Freeport, Ills.	Roots, D. T., Connersville, Ind.
Russell, T. G., St. Louis, Mo.	Russell, D. R., St. Louis, Mo.
Smedberg, J. R., Lancaster, Pa.	Scofield, L. K., Fort Scott, Kansas.
Somerville, Jas., Indianapolis, Ind.	Smith, Thos., Grand Rapids, Mich.
Stacey, Wm., Cincinnati, Ohio.	Spencer, R., Burlington, Iowa.
Starr, J. M., Richmond, Ind.	Stanberry, F. H., Pekin, Ills.
Tayler, Geo. H., Warren, Ohio.	Stout, John, Chicago, Ills.
Twining, E. H. B., Chicago, Ills.	Thompson, M. H., Elgin, Ills.
Wallace, Wm., Lafayette, Ind.	Walker, J. H., St. Louis, Mo.
Woodmansee, J. H., Danville, Ills.	Wirt, R. D., Independence, Mo.

Reading of Minutes.

A report of proceedings of Seventh Annual Meeting having been published in the American Gas Light Journal, a motion to dispense with a reading of same was agreed to.

President's Address.

President Lansden then delivered the following inaugural address:

Gentlemen of the Western Gas Association:

Since it is customary for your presiding officer to present an address at the opening of each annual meeting, embracing matters of interest to our profession, I shall not feel I am taking advantage of my position if I here say I shall endeavor to take up as little time as respect for that position will admit of.

Knowing the number of papers that have been prepared for this occasion, I feel it is due to the best interests of the Association that as much time as it is possible to allot shall be devoted to their hearing, with an after discussion of the many points of practical experience contained therein.

I here ask that when a paper has been read that those who may take part in discussing it will endeavor to keep as near to the lines of the subject treated of as possible. There are so many different matters brought out in our discussions that we are sometimes apt to attempt to follow along in the one debate the process of manufacture from the ashpan to the station meter. By thus concisely disposing of each paper as it is read, our proceedings will be rendered more systematic, and, therefore, become more profitable to us. If questions should suggest themselves to members, during the discussion of papers, that they would like to ask, but which would be calculated to lead to matter that is not really under discussion at the particular time, I would suggest the gentlemen make a note of them, and then drop them into the question-box, where at the proper time they will receive due attention. Our question-box can be opened between the reading of papers, when much valuable information may be brought out.

I see from the number present that the interest heretofore manifested in our Association has not abated; but that, on the contrary, many of you have come together to compare notes, and talk coolly over our past successes and failures, as also, possibly, to attempt a glimpse at the future.

As a consequence of the varying circumstances surrounding us individually as gas makers, it is natural we should have results that will show wide of uniformity. If we find in our experience of the last year we have obtained results more favorable, or have made failures in our experiments, it will be your duty to make known here "their footprints, that perhaps another, seeing, may take heart again."

I desire especially that those who have charge of the smaller works will not be backward in giving to the Association what results they have obtained within the twelvemonth. It is generally in the small works that we have the best opportunity of gaining that which comprises the best and whole knowledge of our profession—from the coal to the meter. Do not think, because you have charge of works containing but one bench (and it may be a setting of threes at that), that you cannot say anything to interest your fellow members of this society.

I would not exchange one month's practical experience for fifty years of delving into the science of gas manufacturing. Science sometimes shortens the route; sometimes it does not. I say, gentlemen, that each one of us must work out his own salvation; and how often it is done with "fear and trembling."

I once heard the president of a small company say, "I think your gas associations are all a humbug, after reading the proceedings of one of your meetings. I found no two of you could agree on anything. Every one had different results." I immediately undertook to show him, from the difference in our surroundings, the great variety of coals, lime, size of plant, amount of gas made, price of coke, tar, and other residuals, that he did not know what he was talking about. The "talk" came out because I was trying to persuade him to send his superintendent to our meetings. I am sorry to say he is not here. This superintendent had also said to me that the published proceedings of the gas associations as they have appeared in the American Gas Light Journal, had been a great benefit to him. He reads the Journal regularly, and *pays for it himself.* I think it would be money well spent by gas companies if they would see that their superintendents were supplied with well-bound copies of the proceedings of the meetings of the various gas associations of the United States.

In consequence of the variety of our surroundings these societies were established that we might come together and find out what each one was doing. Through the acquaintanceship formed here we can correspond with one another, and feel certain that our letters will be answered.

I maintain the formation of these societies has done more to reduce the price of gas than any other single cause. I must congratulate you all that the interests allied to our profession are still holding their own, and can say this, while almost all other sorts of business have shown most sensibly the effects of stringent times. With some few gas companies I understand there has been a decrease in consumption, but only to a limited extent.

With all of those who are devoting their best energies to place our profession where it may properly be understood by those with whom we have to deal, I must say it is not all sunshine. We hear it insinuated that we are not altogether what we should be. Even such gentle epithets as "robbers," "thieves," "swindlers," "soulless monopolists," etc., have been applied to the managers of some of the companies we represent. Think of it; we who toil to give others light—for a small consideration. Could the downtrodden gas consumer be brought to realize the blessing this wonderful discovery has been to mankind, such of them as may have any conscience left would stand abashed. Bartholdies would spring up in every city and village; and strife would be among the people for the privilege of paying for pedestals. It would be "Liberty (gas) lighting the world."

There must be some cause for the condition of public opinion in regard to our particular profession. Shall we not endeavor to find out the cause, and

strive to have it removed? There is no other article that comes into such general use about which there is so little known by the average citizen.

The only medium through which we may reach the people (except the gas bill) is the public press. But what has the public press done toward giving reliable information to the people in regard to illumination by gas? It will tell of the iron interests; note the state of the lumber trade; speak intelligently and accurately about the produce market; blazon forth the price of hops; and it will even speak of feathers—not because they are "light," but simply because they represent an article of trade. What they say of us is usually done in a flippant way—more in derision than in an honest attempt to educate the people.

I do not accuse the newspapers of wilfully misrepresenting us; but I do accuse them of allowing matter to appear in their columns, ninety-nine per cent. of which is written by men who do not understand the first principles of gas making. As a sample, this came under my eye a few days ago:

"*The Thieving Meter.*—Out of 523 Chicago gas meters tested by an expert 518 registered fast, and the company knew it. This, however, is not enough to injure the reputation of a gas company."

Now, I leave it to you, gentlemen, if the writer of that paragraph could ever have seen and understood the mechanical construction of a meter, and then wrote that article. Should not a hatchet be erected over the grave of Annanias, and the champion belt be passed over to this newspaper scribe?

The gas meter, which has been the source of so much derision, stands today as one of the most beautiful pieces of machinery that ever traced its emanation to the brain of man. How strange that it is but a few short years since it has commenced to bring odium upon gas companies. For fifty years it never had been accused of lying; and now, when mechanical science is at its zenith, it has ceased to tell the truth! What would the average consumer think if I should say that a million dollars is ready for the man who can furnish a more reliable and correct gas measurer? No, it is not the meter; and you may think it strange when I say it is only since our gas companies have been making such large reductions in the price of gas that this outcry against the meter has been heard—that silent arbitrator that tells of the particular habits of home life. One meter says, "The woman who presides over this household is a treasure to her husband and family." Another one proclaims, "This is a go-as-you-please establishment; the servants and the children run this house." What is it that the meter does not tell of character in controlling a household? Mrs. Smith says, "My neighbor, Mrs. Jones, has a larger house and she has more burners than will be found in mine; yet her gas bill is not more than half as large as is the case with me." Now, I wanted to tell Mrs. Smith the reason; but I did not dare to. The simple reason was, Mrs. Smith had been brought up in one of the go-as-you-please establishments.

Right here let me say, I must differ with some in regard to the method adopted when the meter statements are taken. Many of the larger companies do not allow the men who take the statements to carry with them the former registration. I think, as they are the only persons who come in contact with the consumers, they ought to be men of such intelligence that they should be required to make out the bill at the house and leave it with the consumer. Here is the result of the other method. Once I happened to be passing along a particular street when a meter taker happened to be leaving a house just as "Bridget" was engaged in scrubbing down the stoop steps, and so I overheard the following dialogue: Said Bridget, "How much is the gas bill this month?" Response: "I cannot tell you; you must call at the office." Said Bridget: "Sure you can guess at it here as well as at the office." When an inspector gives such an answer the consumer is puzzled. They know quite well if there is anything about the meter calculated to tell how much gas they have consumed the inspector knows it; and why he should say "he cannot tell" is more than they can understand. Then, as the papers so often say, "it is all guess-work," and the consumers are ready to believe the assertion.

In consequence of the reduction of the price of gas in a city the average consumer makes up his mind that his bills are going to be reduced in proportion; and as it is so convenient to have more light, he immediately educates himself and family to the use of more gas. By the time his first bill, under the reduced rate, comes around he has consumed probably double the amount formerly used under the old price. What is the consequence? He blames it on the meter, curses the gas company, and refuses to be comforted.

When I said to a gentleman, a short time ago, I send out to a majority of our residence consumers more gas on the mornings of December, January and February than I do to the same consumers in the evenings of June, July and August, he could not believe it at first; but finally he admitted that even in his own house he consumed more gas on winter mornings than during summer evenings.

A lady once said to me, "Mr. Lansden, will you tell me why my gas bills are as large, if not larger, than before the price was reduced? I have the same house, and same servants; and, in, fact, everything as it was before." (The gas rate had been reduced in that district from $2.50 to $1.50.) I asked her if she had taken the same interest in looking after the gas as she had done when the price was $2.50 per thousand. She said, "Well, I supposed my bills would be much less in consequence of the reduction. I really have not paid any attention to it." I told her the old story: "If you expect to reap the benefit of a reduction through smaller gas bills you must pay the same attention that you gave to the matter before the reduced rate went into effect."

As it appears in the nature of an impossibility to make the public feel that our interests are mutual, I heartily concur in the idea that is being advanced in some of the States—that of having a State Gas Commission, similar in nature to those at present having charge of the railroads. This is, in my opinion, the only way the problem will ever be solved. The time has gone by when gas companies should expect to realize more than ten per cent. on their capital. I think a large majority of them would now welcome any movement which would tend to place their capital in a safe position. Anyone who will take the trouble to go over what has been done in Europe will see that this was there the last resort; and the method has come quite near to effecting a solution of the problem.

I hope time will be had during this meeting when the subject may be brought up and thoroughly discussed. I feel confident that a majority of gas companies would do all in their power to assist in the movement for a State Commission.

I am glad to see that there has been a movement in the way of forming State Associations in the West. I know we are all glad to welcome the Ohio and Iowa State Associations formed within the last year. You all have seen from the published proceedings of the first-named that it starts out in the right way. I think it will be well for those of us in other States to follow in their footsteps. Matters of mere local interest can then be brought out, and which could not be properly attended to in our larger Associations.

It becomes my painful duty to notify you that death has made its first claim from among us since our organization. It has taken one whom we all loved and respected. His genial face will no more gladden our hearts as in days gone by. Mr. Thomas Butterworth was the second President of our Association; no one took a greater interest in its success, while in its younger life, than he, and to him is due much of the interest that is now being manifested in its more mature years. When such men are called from among us we sorely feel the blow. Let us all try to be governed by the same sturdy principle—that of justice to all—manifested by him throughout his life. I would suggest that a committee be appointed to draw up appropriate resolutions, a copy of which should be sent to his family, and another be placed upon the records of our Association.

I also bring to your notice the death of one of our associate members—Mr. George Downing. I would suggest that a committee be appointed to bring before the Association such resolutions as may be appropriate to the memory of our deceased brother.

Thanking you for your kind attention, I announce that the regular order of business will be proceeded with.

Committee on President's Address.

Mr. McMilllin moved that the Secretary appoint a committee of three, with instructions to consider Chairman Lansden's address, and to report back their conclusions thereon to the Association at its afternoon session. The motion being agreed to, Secretary Littleton appointed Messrs. E. McMillin, Columbus, Ohio; S. H. Douglas, Ann Arbor, Mich.; and R. H. Canby, Bellefontaine, Ohio, as such committee.

New Members.

On motion Messrs. James Somerville, Indianapolis, Ind., John Gimper, Leavenworth, Kansas, and E. J. King, Jacksonville, Ills., were appointed as a committee to receive and report upon applications for membership. The committee subsequently made a favorable report upon the applications of the following-named gentlemen:

Allison, J. W., Jackson, Tenn.
Brown, F. G., Madison, Wis.
Blinks, W., Michigan City, Ind.
Bixby, W. A., Galena, Ills.
Cowdery, E. G., Milwaukee, Wis.
Clark, Walton, New Orleans, La.
Egan, James, Galva, Ills.
Jenkins, E. H., Columbus, Ga.
Levings, W. H., Paris, Ills.
Mayer, J. F., Baltimore, Md.
McMillin, G., LaCrosse, Wis.
Parlin, W. H., Canton, Ills.
Scobey, T. E., Cincinnati, Ohio.
Snow, G. B., Buffalo, N. Y.
Tarvin, R. J., Cincinnati, Ohio.
Bradley, C. D., Chicago, Ills.
Bogue, O. A., Hyde Park, Ills.
Baxter, I. C., Evansville, Ind.
Butterworth, W. C., Rockford, Ills.
Critchlow, J. M., Beaver Falls, Pa.
Connelly, T. E., Pittsburgh, Pa.
Faben, C. R., Jr., Toledo, Ohio.
Kellogg, L. L., Sioux City, Iowa.
McKnight, G. F., Chicago, Ills.
Murphy, J. M., Nebraska City, Neb.
McClary, N. A., Chicago, Ills.
Persons, F. R., Chicago, Ills.
Stannard, A. B., Philadelphia, Pa.
Starkweather, G. F., Chicago, Ills.
Thompson, J. D., St. Louis, Mo.

Woodmansee, R., Davenport, Iowa. Worcester, E., Chicago, Ills.
Williams, C. W., Terre Haute, Ind. Wells, E. D., Atchison, Kansas.
Wolverton, Chas., South Bend, Ind. Webster, W. M., Chicago, Ills.

Upon motion, the Secretary cast the ballot of the Association for the applicants named in committee's report, and they were declared to be duly elected to the privileges and duties of membership. The newly elected members were thereupon formally introduced.

COMMITTEE ON OBITUARY RESOLUTIONS.

On motion, Messrs. J. B. Howard, Dubuque, Iowa; Jos. R. Thomas, Brooklyn, N. Y.; and G. G. Ramsdell, Vincennes, Ind., were appointed to draft and present resolutions of regret and condolence in regard to death of Mr. Thomas Butterworth, of Rockford, Ills.; Messrs. E. H. Jenkins, Columbus, Ga.; T. A. Cosgrove, Evanston, Ills.; and J. M. Starr, Richmond, Ind., receiving instructions to perform a like service to the memory of Mr. G. E. Downing, of New York city.

WELCOMING THE VISITORS.

The following-named gentlemen were formally introduced to the Association as heartily welcomed guests. They were invited to seats in the Convention, and the most courteous and hospitable attentions were paid to them during the time of the sessions.

H. E. Floyd, New York city. L. P. Gerould, Manchester, N. H.
J. P. Harbison, Hartford, Conn. A. B. Slater, Providence, R. I.
Capt. W. H. White, New York city. J. H. Walker, Rochester, N. Y.

As the introductions were proceeded with each of the guests responded appropriately to the generous greeting extended, Mr. Harbison, Mr. Slater, and Capt. White, as usual, excelling in the neatness of their acknowledgements.

COMMITTEE ON NOMINATION OF OFFICERS.

A discussion hereupon arose as to the best manner to be pursued in electing officers for ensuing year. Owing to the way in which the matter had been spoken of at the sessions of '84, President Lansden refused to take upon himself the duty of selecting a nominating committee. The question was finally disposed of (on motion made by Mr. Starr), by having a nominating committee of five selected at the suggestion of individual members in open session. This plan resulted in the choice of Messrs. J. B. Howard, Dubuque, Iowa; J. M. Starr, Richmond, Ind.; S. H. Douglas, Ann Arbor, Mich.; T. A. Cosgrove, Evanston, Ills.; and T. G. Foster, Montgomery, Ala.

President Lansden—Having disposed of pressing routine business, the next regular order is the reading of papers.

[To be continued.]

[OFFICIAL REPORT.—Concluded from page 262.]

Papers Read before the First Annual Meeting of the Ohio Gas Light Association, with Discussions on Same.

FIRST DAY.—EVENING SESSION.

When discussion on Mr. Tayler's paper* had been brought to a conclusion the Secretary read a paper by Mr. Hawley, of Albany, N. Y., on the subject of "The Bunsen System of Burning Gas as a Fuel." [This paper, being a voluntary contribution, was not forwarded us by Secretary Butterworth.]

To the President (General Hickenlooper) had been assigned the task of preparing a paper to the question of—

"WHAT IS THE LOSS IN WEIGHT OF COAL FROM A STORAGE OF SIX MONTHS, OR THE DIFFERENCE BETWEEN WEIGHTS OF COAL WHEN PUT INTO COAL HOUSE AND WEIGHTS CHARGED INTO RETORTS?"

The General explained that he had not had sufficient opportunity to prepare a properly arranged paper on the subject, but would verbally and briefly relate the result of an experiment (and bearing upon the topic) made at the Cincinnati works some time since. The speaker then proceeded:

A certain number of pounds of coal were put into a box open at top, with lattice-work sides, and placed on a loft over a stack of benches; an equal weight of coal was placed in an open shed in yard; while a third coal portion was filled into a box similar to one above described and placed in convenient situation on top of tank wall of one of the holders. After a year had elapsed the coal was reweighed. That near the stack had lost 11 per cent.; that in the shed had decreased 10 per cent.; and the third lot (the one which had been placed on coping of tank wall), greatly to the surprise of the gentleman who had charge of the experiment, showed a loss of only 1.74 per cent. The last result might, in great part, be attributed to the fact that, just previous to the reweighing, there had been a heavy rain storm, although there was no extraneous appearance of moisture about the coal. A fourth coal portion, taken from a coal "wall" on river bank, where it had been exposed to action of elements for about three years, showed a loss of 13 per cent. It appeared rather odd that of the three first mentioned lots the one on tank wall, or in most exposed situation, should develop the least percentage of loss, yet such was the fact. Of course there must have been somewhat contradictory conditions at work, since the river-bank specimen had lost 13 per cent. The three portions were of an identical grade—second pool Youghiogheny—taken from one and the same mine.

Discussion.

Mr. McMillin—These are very interesting figures, and it would require some thought to get at an idea of what caused the loss. It is important, since the best result we can get from Youghiogheny coal is a 25 per cent. yield in gas.

President Hickenlooper—I will call attention to the fact that we also tried experiments on samples of coal that were in our yards for 10 or 12 years, in comparison with new coal, and there was very little difference in the yield between the old and the freshly mined.

Mr. Huntington—Then it is your opinion that the shrinkage is not all due to loss of gas?

Mr. Hickenlooper—It cannot be.

Mr. McMillin—I do not see how it is possible for any of the ash, or solid carbon, to get away! The only other cause for shrinkage, then, is moisture evaporation, and Youghiogheny coal usually shows only about one per cent. of contained moisture. Youghiogheny coal, though, does contain 7¼ per cent. of oxygen, and, of course, that does not count for anything when you come to make gas.

Mr. Huntington—Would not that oxygen, from its passing away, rather tend to increase the nominal value of a coal for gas making purposes, through increasing the percentage of gas produced from a given weight?

Mr. Printz—Could we not partly account for the loss by remembering that 100 pounds of freshly-mined coal would have a greater bulk than the same weight of the old material?

President Hickenlooper—Of course, if you take coal by the pound, a bushel of the lighter sort would not yield as much gas as that given off from a bushel of the heavier kind; or it would take a greater number of bushels of the old coal to produce a certain yield of gas than would be the case with the new—although the same result might not follow were the quantity figured in pounds.

Mr. Fullagar—Some years ago I had an idea of spreading the coal out over the floor of the retort house, with a view of drying out all the moisture. I think, should we do that, and the practice would extract all vapor, we would save the money we are now spending in driving out the contained moisture during the process of carbonization.

Mr. McMillin—President Hickenlooper tells us that the difference in the yield per pound of coal between coal that had been stored 10 or 12 years and coal that was newly mined was but very slight. Now, we must not infer from this that we will sustain no loss by storing coal through long periods. The loss occurs from having 10 or 12 per cent. less pounds weight of coal from which to make gas when we come to carbonize the coal after its long retirement underneath our storage sheds.

SECOND DAY—MORNING SESSION—FEB. 19.

The last paper on regular list was presented by Mr. J. Anderson, of Ironton, Ohio. The communication was presented in response to the question:

"HOW CAN THE FORM OF THE RETORT, OR THE MANNER OF SETTING THE SAME, BE IMPROVED?"

Upon being formally introduced, the author read as follows:

Mr. President and Gentlemen:—The request to read a paper before you only reached me a few days past, and when at quite a distance from home. Now, as I returned to Ironton on Feb. 16th, I have had very little time to prepare it; and, besides, I feel as if others of you could have "filled the bill" with more ability, as, given sufficient time and study, much of interest could be said on the subject of "The best form of retorts and their settings"—since from the first discovery of coal gas they have been the most useful agents in its production. I therefore ask of you allowance for my shortcomings.

In 1792 Mr. Murdock, a Scotch engineer, then in the South of England, discovered the availability of coal gas for illuminating. He made many experiments during a number of years, and finally brought his ideas into practical use. In 1797 he lighted his premises in Old Cumnock, Scotland, and in 1798, again in 1802, he illuminated the great Soho Iron Works, in Birmingham, at times of public rejoicing. These were the first attempts at public displays of the use of gas of which there is any positive record, and were at the time, I expect, wonderful and attractive.

The first holder used was a simple bladder—as Murdock carried the gas in bladders to light his path home from his works during the winter evenings.

The first gas retorts of which we have any knowledge were shaped like a coffee pot; the charges were small, about 15 pounds of coal, and as the vessels were filled and emptied through a mouth at the top, it was a trouble-

* See JOURNAL, issue May 16, pp. 261-2.

some task, more especially considering the numerous operations required in the handling of such small quantities. Through a long number of years there were various changes in the forms and sizes of retorts, as also in the manner of setting them. Among these some had turn-tables in them, while others had trays on endless chains. The charging material was broken up as small as nut coal and thinly spread; but I deem it unnecessary to take up your time in further remarks on iron retorts, as their history is now a thing of the past.

The advent of fire-clay retorts may be said to have come in with Grafton, who patented his make in 1820. It is true their manufacture had been tried previously in some such manner as at present made; but as I presume the manufacturers did not understand the manipulation of clay at that time, or at least to such degree as it is comprehended now, their tendency to crack threw them out of the market, and caused the adoption of Grafton's, which were built of flanged tiles. Some of these were of large capacity, taking charges of from 500 to 1,500 pounds, with only one retort in an oven, and carbonization was completed in from four to five hours. These large and thick retorts were not profitable, however (although they lasted from four to six years), for they required comparatively immense fires, consuming 70 per cent. of the coke.

Subsequently the ordinary clay retorts were made in sections, two or three lengths in a retort, and at some works in Europe these are continued to the present day; indeed, there still are some built of brick. In this country clay retorts are made in one piece, with the exception of through retorts, which are made in two or three sections.

The question of the best size of retorts for service is an important one, and there is a limit, of course, to all things. I think there is no doubt the larger ones are the more profitable, as the difference in cost is trifling over that of the smaller sizes. They have greater capacity; their charges can be more conveniently increased or diminished as required; and their heating costs not as much in proportion to their work. The disposition of practical gas engineers and superintendents generally inclines to an increase in the size of retorts; and most if not all the ovens now going up are of dimensions fit for the reception of the largest sizes in use. Of course, where ovens already built are small, the benches must be suited to them; but in many of these, by a change of setting, larger retorts could be used; sometimes an additional retort may be set, and changes in three or four benches would materially improve the situation, and probably economize to the extent of one fire.

There are several forms of retorts in use; of these the round, the eliptical or oval, the arch or ⌂, and the combined arch and oval are the most general shapes.

The round retort is considered the strongest, as least susceptible to changes of temperature; but its form is objectionable because of its greater height in proportion to its capacity, and the impracticability of spreading the coal in it.

The oval retort comes next to the round in its unsusceptibility to changes of temperature. The charge can be spread more evenly, and, as we know, these retorts give good satisfaction in the Pittsburgh, the Laclede, the St. Louis, and both stations of the Cincinnati works—especially so in the latter, where there are 224 through and 640 single retorts set, and which are worked with the highest heats obtainable. After several years of experience they are preferred to the ⌂-shape.

A question comes in here—May not the movement in the charge during carbonization affect the retort? The charge first becomes partially solute before caking. As it softens in its early stage it settles down; then as it hardens into coke it swells, and, especially in heavy charges, sometimes resorted to, the expansion may press more on the arching sides of the retorts than we know of. The oval retort would not be quite as liable to be affected by this movement, as the coal does not usually fill up level with the center. As it widens out to the center, there is space for expansion of the charge without impinging on any part of the retort; while in the ⌂-shape the sides contract on or immediately over the coke.

The arch or ⌂ retort is the most general shape in use; and probably may so continue, from the fact of its greater capacity for a well-spread charge. Of these, for example, I consider a 15″ × 23″ stronger than a 14″ × 22″; or a 15′ or 16′ × 26′ stronger than a 14′ × 26′. The form gives a stronger arch, and they are preferable for use excepting where their height, as in benches of sixes, would make them inconvenient to work.

As for the combined arch and oval retort, I cannot see proper compensation in them for their diminished capacity.

There was a retort patented by a Mr. Scott, of Musselburgh, about ten years ago, built like a cupola, of a capacity of 1,500 pounds, charged through a hopper at top, and drawn by the movement of a grate at the bottom, resting in what may be termed a basin, which sealed the grate; but its working has not been satisfactory. There may be a day when gas will be generated in cupolas, or the like, of large dimensions; but efforts experimenting in that direction have been few as far as heard from.

There is also the Davidson retort, of peculiar shape, and covered by patent. I cannot say if it is equal to what the patentee claims for it, as my information is solely gained from his circular, which I have no reason to doubt.

The plans of settings are quite numerous. Through retorts in large gas works are the most economical. They have greater capacity for the space occupied in a range; require comparatively less fuel in heating; are kept free from carbon by opening both ends when changing charges; and have less change of temperature, through changing fires at only one end at a time.

All large gas works should have benches of six (or more) retorts, especially those having long ranges of benches, where the steam stoker could be applied to advantage. In benches of six (or more) retorts, especially with generative or regenerative furnaces, the bridge-wall setting is very good. A strong draught is required by this setting; but with ordinary fire boxes, I believe, while higher heats, better distributed, may be attained, not only is there an intense heat drawn up the face of the bridge-wall, and damaging to the sides of the retorts nearest, but the same parts are exposed to the sudden changes of temperature from the open door when firing and clinkering.

The late Mr. Sabbaton, of New York city, to whom American gas men owe much, and whom all should hold dear in memory as a benefactor of gas interests, has left us great improvements in settings, suitable to nearly all sorts of benches; and his plans, with some modifications by the several manufacturers, are the most general in use. Through the competition rife between manufacturers, however, the settings have been scaled down in quantity as well as in price; and the tiles and blocks are so light and narrow that at the present time the retorts have not proper support or protection in many instances. And, I must say, there is a disposition among gas men to give encouragement to this practice, to their own detriment; and if, instead of bargaining by bulk at so much per bench, they would buy by the piece and per weight, relying on and seeing that the manufacturer gives just all that is necessary, they would be better served. For a good setting a fair price can be afforded with gain.

I do not think it prudent to build sixes in small works, where good stokers are not always available. Benches of fives are more easily managed; for if any retorts are slighted by the stoker they are the top ones of sixes—the top retort in fives is not so high. In some places, where it is difficult to secure good stokers, it might be best to follow the old style of setting fives—with three in line and two on top; but with good stokers, setting up a bench with retorts two and two abreast, and one on top, is preferable, as more economical to set and work, besides occupying less space.

There is no doubt that the more retorts that can be conveniently worked in a bench, over one fire, the less the cost of manufacturing; and no works of any magnitude should run small benches, as the remodeling of the retort house, with entirely new benches, would repay the cost in a few months' operation of the works.

[Mr. George Anderson, of England, adds a supplementary bench of threes to his sevens, which he heats from the same fire.]

It would be difficult, I venture to say, to find a man of practical experience in working large benches, to attempt to controvert this, or any but a crank to gainsay it.

Furnaces for benches should be ample in proportion to the size of the oven. A 12″ × 42″ × 22″ fire-box would suffice for an oven 6′ 6″ × 9′, with threes; while a furnace of 15″ to 16″ × 54″ × 27″ would be necessary for an oven 7′ 6″ × 9′, with sixes. The plain furnace is best suited to small works; and I think that where furnaces cannot be had to stand out the life of the benches, it is well to build them of hard-burned, pressed furnace blocks, say 6″ wide, and put in after the plan called by masons as "stretchers," not as "headers," two in a course, so that those next the fire, as burned and broken out, may be removed and fresh blocks set in. Furnaces should be set well below the bench, and not up between the two lower retorts; and too much space should not be lost between the grate bars and ashpans. In many places that I have visited the fires stand too high from the ashpan, receiving too much air and deriving no benefit from the water in the pan underneath.

In a works of even moderate, as well as in those of large size, where the the manufacture warrants a double-stage retort house and regenerative furnaces, it pays to have them. These furnaces may be built under or in the rear of the benches, or even, where pits may be formed under the level of the floor, they can be built under old works. A depth of seven feet below the bottom retorts is ample space for some of these furnaces. They are the most economical, give greater and more regular heat with less fuel, and require less attention than ordinary fires; and besides the cost of construction is not so great an item as to be objectionable where they may be made available.

Discussion.

Mr. Fullagar—Mr. Anderson seems to advocate benches of fives—with two retorts on top. In the first place this setting requires an arch of fire brick over the furnace. How long will the middle retort last?

Mr. Anderson—It will last as long as the others if properly set.

Mr. Fullagar—We at one time had an old English setting of that sort, and the middle retort had to be supported by a slab of the heavy Zanesville stone. That middle retort never lasted over six months. I think the Mobile and New Orleans works are the only ones in this country employing that setting.

Mr. Anderson—Mr. Fullagar should remember that I recommended the use of those benches only in certain cases. I say I do not think it prudent to build these in small works where good stokers are not always available. I would say to Mr. Fullagar that I think I could put in a bench of that description so that the middle retort would not burn out any sooner than the others. In some places in England—it may be the case here—they build an arch out of what they call crown brick, and then tile on top of it. The heat cannot injure the middle retort much more than it does any of the others. It is the strength and thickness of the arch that gives protection from the heat.

Mr. Fullagar—The difference in height between that and the old setting is only 9 inches. I do not see why a stoker should mind that.

President Hickenlooper—Do you mean that the arch is continuous, or are small arches thrown over every 8 or 10 inches?

Mr. Anderson—It is continuous.

Mr. Coverdale—I rise simply to make the suggestion that this discussion as to the setting of retorts should be made as thorough as is possible. If gas companies are going to remodel their works in the attempt to reduce the cost of manufacture, in order that they may reduce selling prices to consumers, we must begin by solving this question. We must commence at the retort. We desire and expect to receive the benefit of the experience of those companies who have spent a good deal of money in this matter; and get that knowledge, too, without having it cost us anything. We want to start where they left off. I would like to say, also, that the papers read at this meeting have been most interesting. They show that our members are pretty well up in their business.

President Hickenlooper remarked that it was difficult to explain one's views about bench settings without drawings to illustrate the oral description; but asked Mr. McMillin to attempt it.

Mr. McMillin—I think we have made some progress at Columbus in the manner of setting retorts, and building furnaces; but, as our President remarked, it would be very difficult to explain what we have done without drawings. We employ several forms of furnace. We have four benches of sixes set on about the Cincinnati plan. On first starting them up we used perhaps 33 per cent. of the coke made; but we had been using 50 per cent. in the old settings they replaced. As our men got accustomed to handle the furnace, they soon brought the coke feed down to 25 per cent., and while we are now using just one-half the quantity of coke that we used before, we have also increased our output. These four benches are really making as much gas as any other six of the old style. The longer we run these—the "Cincinnati" furnaces, as we call them—the better we like them. We will build four more of them this summer; or rather we will put Cincinnati furnaces under all of the benches in that section. This winter we constructed eight benches in an old building where we had no basement. We went down so as to get a furnace about 3½ feet deep; and that was as low as we could get. I do not know what sort of furnace we could call it, for I never saw anything like it elsewhere. All its parts have been used before in some other furnace; but, owing to the condition of affairs at Columbus, we had to combine a good many things. It is not only a gas furnace but it is also a regenerative furnace that heats the air by waste gases and evaporates water by the waste gases passing through flue under ashpan. The saving, so far, has not been so great as that gained with the "Cincinnati" furnace, although finally I think it may be even greater. We have only run them since Christmas time. When our men have been handling them as long as the others this furnace ought to take up even less fuel. I must say, though, that we have not got the depth in them that we ought to have. In the construction of this furnace we tore out the retorts and went right down below the earth at bottom of the old foundation. The bottom of the ashpan was down on a level with the earth, and the escape flue still below that again. The grate bars were placed only a few inches (perhaps six) above the top of the ashpan, allowing just enough space to get a shovel in. The gases, as they pass up, are made to travel back and forward several times, and finally reach back to the end of the setting, then coming forward under the ashpan, evaporating water and sending steam into the furnace. The air for secondary combustion is heated by passing through several inch and a-half gas pipes. In every alternate course of brick is laid one of these pipes, extending from within 9″ of the front wall to within about 2′ of the back wall. The back end opens into a chamber 2×4 feet, and 2 or 3 feet deep. The cold air is admitted through a little sliding door. That is opened so as to give a space of about ½ to 2½ inches for secondary combustion. In the large chamber it is subjected to a great deal of heat before it rises, and travels forward through small holes over the coke in furnace and combines with the gases for secondary combustion. To look through the furnace when in operation you would think there was a high illuminating gas going right out of those lateral openings; but there is no gas in these holes, for we see only the gases from the furnace which burn with a blue flame outside and with the intensity of a white flame inside. We might and do carbonize almost any quantity of coal that can be put into the retorts. We have no occasion to use a clinker-bar; and that is the biggest gain in any of these furnaces. The ashes are shoveled out; there is no need of drawing grate bars at all. With the "Cincinnati" furnace we are running very high heats in our retorts. We can melt pig iron if necessary; and yet in the producer part of these furnaces the clay joints are apparently as perfect as they were the day we fired our benches. They are hardly red-hot. I expect to burn out a dozen settings without ever renewing the furnaces proper. My old experience was that the furnace would "let down" first. They would not have been running three months when you could bury a beer keg in the furnace walls. The heat would melt brick walls right down. When you find you can crowd these benches as much as you want to, without letting down the heat, you often find you can run with one bench where, under the old system, you would have been obliged to use two or three. It does not seem to make much difference what quantity of coal you put in them. You can heat them just as hot as you like. I had expected Mr. Anderson would tell us, not only how retorts are made and what the best forms were, but also how to make entirely different settings. I am not fully satisfied with the present arrangements. I would like to see coal put in by the ton and never touched from the time it is put into the retort until it is turned over to the consumer, either in the shape of gas or coke.

Mr. Anderson—I suggested that probably the day may come when cupolas will be used instead of retorts; but that is hardly for the present. I would like to ask Mr. McMillin if he uses steam under his fires, or whether he relies only on water in his ashpan?

Mr. McMillin—We use steam under the "Cincinnati" furnaces. They do not evaporate any water. The other furnaces do not evaporate as much water as I want to pass into them; but the sending in of steam is not essential. Mr. Enfield is managing that part of the works and has given it more attention than I have.

Mr. Enfield—I do not know that I have thought very much over this matter of the manner of settings; but one point in Mr. Anderson's paper attracted my particular attention. He thought in many instances the retorts were not getting sufficient bracing. I have had experience with benches set in what are called skeleton settings, or practically, instead of putting in five or six blocks along the length of retort, not more than two or three are employed. The idea, I believe, is to have less material for the oven to heat up. At first I thought well of it; but I now confess I do not think so favorably of the plan. After a retort has been subjected a short time to the heat of the ovens, it begins to break up or crack in all directions. When we attempt to patch up the retorts in the effort to hold them together our most important aid is found in the surrounding supports; and while we might have too much material around them, I think we should avoid having too little. We should have a good firm setting. I think one great consideration is to have a furnace large enough. I have known a furnace to consume 60 per cent. of the coke made, and also have known some of the old style which took up 33⅓ per cent. I always favor large furnaces and slow combustion, as giving less clinker, and showing less wear and tear. It is hard to say definitely what forms the settings of the future will take; but it is perfectly safe to say that the engineer of the future will be aggressive and pushing. One thing, however, is sure of development, and that will be some arrangement to show definitely what heats we are working at. I think now we too often go to extremes. The stoker's eye is not infallible, and so cannot be always trusted. When the chemist desires to bring out a certain result in distillation, he strives for a definite heat, and at that heat he gets a definite result; but in gas making one day we run at a high heat, and the next day at a low one. Could we not do better if we knew precisely at what temperatures we were working?

Mr. Fullagar—My experience goes to show that the oval form of retort is the best. One reason is that in cases of cracks or breaks the retorts are more easily patched, as the flames pass around the surface instead of impinging on the corners; a second is, greater ease in drawing the charges. As to settings for benches, I think the Sabbaton plan should be awarded the palm. The fault with all retorts made in the United States is their after-expansion, often so great as to burst out the front walls. What can the stoker neglect in the top retort? He has only to draw the coke out of it. As I said, I think the Sabbaton setting and the oval retort is the best working method for any engineer to follow. The first improved furnace we built at our works was, I think, 30 inches between walls, 5 or 6 feet in height, and 4 feet in length. From that we got very good results; indeed, I might say the results were splendid. Fire-brick men talk about their fire-brick, etc. If we are going into improved furnaces, the fire-clay workers will have to furnish us with better materials than they are giving us now. The fire-clay manu-

facturers send us very nice samples; but somehow or another "mistakes" occur in mixing the clay in different style from that pursued in getting up the sample lot. Clay is taken out of the bank to-day, is put under the water tank, and to-morrow the brick is in the kiln. It is a wonderful thing with them now to "weather" clay for a month. In olden times a year or even two was taken up in "weathering." Another thing: do they make proper analyses of the clay? A portion taken from one section of the bank is brought to you; you test it and find it good, and you give an order. When the brick come to hand they are not up to the test; they will shrink and let down the work. The manufacturer's agent comes to you, and, after some talk, he agrees to furnish material for your benches that will last three years; if you get three months out of the material you are lucky.

Mr. Anderson—I believe in benches of sixes where it is possible to run them. I do regret that in country places good stokers are hard to get; but gas companies in country districts have now "skinned" things down very low. They will pay $30 for an inferior man when they could get a good one for $40 a month. With regard to Mr. Fullagar's remarks about quality of bricks. When we understand better where the different kinds of brick are to be used—those that are to be put in an open fire (which should be strong and dense), and such as are to be used in arches, etc.—perhaps then we will be able to approach more closely to Mr. Fullagar's views.

Mr. McMillin—One thing which I think very important in small gas works is closing up the space between the grate bars and ashpan, so as to let in about 1-20th part of the air usually passing in. In the old form the opening is sometimes 14 by 22 inches, and the air that will pass in at that point will carry off about 50 per cent. of the heat. We close up the space under our grate bars with doors.

Mr. Anderson—I am glad that Mr. McMillin has alluded to the unnecessary space under the furnace often found in small gas works. I have seen many places where the openings are 12 by 15 or 14 by 16 inches, and also have seen in many small works where no attempt was made at closing up the openings. All that is necessary is to place a piece of sheet iron, pierced with holes, before the opening; and it would be much better if the doors were kept nearly closed.

[The discussion was carried on at some further length, Messrs. Hickenlooper, McMillin, Tayler, Enfield, and Hamlin participating therein; no essentially new points were brought out, and at its conclusion the Chairman declared the regular business sessions of meeting of 1885 as finally adjourned.]

[A Paper read before the Guild of Gas Managers.]

The Effect of Carbonic Acid on the Illuminating Power of Coal Gas.

By C. J. R. Humphreys.

It seems an apt commentary on the incongruity which occasionally attaches to decisions emanating from the goddess of chance, that when the Guild decided, a month ago, to make a new departure in its mission of usefulness, by having papers read at the monthly meetings, and intrusted fickle chance to determine who must take the lead, that she should have elected that this duty and honor should fall on one of your latest recruits; for it would certainly have been more in keeping if to one of the older members had been committed the task of taking the initiatory, so that from the outset the standard for the papers could be established in a manner which would be most pleasing to the members of the Guild. As, however, there is no appeal from the decision of the tribunal invoked, I would ask your kind attention to the subject of these remarks, namely—the effect of carbonic acid on the illuminating power of coal gas.

The matter may well be considered under three heads. Under the first division I would briefly record the extent of the present knowledge of our theme. Passing on to give you in the second section an account of the experiments I have recently made in the hope that I might obtain some light on this question. And, finally, I would try and draw from the foregoing premises such deductions as the facts would seem to warrant.

It has generally been held that, by permitting the carbonic acid which comes over from the retorts along with the gas to remain therein, the illuminating power is destroyed to the extent of two candles. This statement is, however, a very general one, and has seldom been backed up by a record of exact experiments. We have, however, at hand one series of tests, the teachings of which are very instructive. This record is found on page 10 of Mr. Hinman's report for 1882. Mr. Hinman took the ordinary Boston gas, and mixed with it certain percentages of carbonic acid gas, and obtained the following results:

Experiments with Argand Burner.

Percentage of Carbonic Acid.	Loss of Light in per cent.
1.3	2.3
2.8	5.4
4.9	9.2
7.5	15.1

Experiments with Flat Flame Burner.

Percentage of Carbonic Acid.	Loss of Light in per cent.
1.4	6.3
2.5	12.4
3.9	16.9

You will note from these tests that the loss of light, when using a flat flame burner, is greater than in the case of an Argand. When using the former burner the lighting quality of the gas is reduced by 6.3 per cent. from the presence of 1.4 per cent. of carbonic acid—this, with 17-candle gas, means a loss of 1.07 candles. I will now give you a brief account of the experiments I have recently made bearing on this matter. Premising the description with the remark that at Lawrence we have been in the habit of passing the gas through three boxes of iron sponge, and then cause it to traverse two boxes of lime; but we have not pretended to use sufficient lime to remove all the carbonic acid. The point I wished to determine was what would be the pecuniary effect were I to use more lime and extract all of this impurity?

To solve the problem I erected in the photometer room at our main office a purifier 2 feet by 2½ feet and 1½ feet deep, and so arranged the connecting pipes that I could cause the gas to flow from the main direct to the test-meter; or I could force it through the purifier before passing to the photometric apparatus. The purifier was filled with lime well moistened. All the tests were made in pairs. I would first determine the quality of the gas as it came direct from the supply pipe; then I would change the valves, so compelling the gas to pass through the purifier, and ascertain the candle power of the purified gas. The following is a record of the experiments:

No. of Test, and Date.	Style of Burner.	Loss of Light in Candles.
1. March 26	Argand, D	.7
2. " 26	"	.6
3. " 26	"	1.0
4. " 27	"	.7
5. " 27	"	.9
6. " 27	Bray, No. 3 Special	1.4
7. " 28	Bray, No. 5 Special	.6
8. " 28	Bray, No. 5 Special	1.0
9. April 1	Sugg, No. 5 Batswing.	.8
10. " 1	Sugg, No. 5 Batswing.	1.0
11. " 1	Empire Batswing	1.0
12. " 1	Empire Batswing	1.4

In the above statement column No. 1 shows the number of the test; No. 2, the date on which each experiment was made; No. 3, the style of burner employed; and No. 4 shows the loss of light by reason of not passing the gas through the lime purifier. Experiments Nos. 1 to 5, inclusive, were made on the standard Sugg's Argand; the average of these tests showed a loss of light, of the unpurified contrasted with the purified gas, of 0.8 of a candle. Experiments Nos. 6 to 12 were made on different styles of flat-flame burners; the average of these showed a loss of 1.03 candles. In these tests I was very careful to have all the conditions alike during each half of the experiment. I was particular to consume gas at the same rate when passing the gas through the purifier as when running without it; and I was extra careful in this regard when working on the flat-flame burners. All results were figured to a basis of five feet of gas an hour before ascertaining the loss of light.

I was desirous of informing myself how much carbonic acid the gas contained, so that I might know to what percentage of this impurity the falling off in candle power was due. I therefore had an analysis of the gas made as it was passing direct from the main, and also after it had traversed the lime purifier. The analysis of the unpurified gas was as follows:

Analysis of Gas Made March 28, by C. D. Jenkins.

Illuminants	5.42
Marsh gas	37.24
Hydrogen	48.68
Carbonic oxide	6.04
Nitrogen	1.30
Carbonic acid	1.32
	100.00

The analysis of the gas after passage through the small purifier showed that it was free from carbonic acid. Therefore, to summarize the work as far as we have gone, the presence in the gas of 1.32 per cent. of carbonic acid caused a loss in illuminating power of 0.8 of a candle when the gas was burned through an Argand burner, or a loss of 1.03 candles when a flat-flame burner was used.

We wish now to determine whether, as a matter of dollars and cents, it would be preferable to use more lime and take out this impurity, or, leaving it in, make up for its presence by charging more cannel. This brings us to the preliminary consideration. Which series of experiments shall we take

as a basis to figure from? Shall we say the loss is 0.8 or 1.03 of a candle? Obviously the latter, because the flat-flame burners are the kind generally used; and we make gas to give light unto the world, and not to toy with in photometer rooms. This being granted, we have to ascertain the cost of putting back this 1.03 candles into the gas; and, on the other hand, to make note of the expense of removing the 1.32 per cent. of CO_2. To add this candle power to the gas would require 5 per cent. of cannel, costing 2.3 cents per thousand feet. The expense of removing the balance of the carbonic acid would be 0.6 of a cent, while the loss due to the diminution of volume by the extraction of this impurity would be 0.5 of a cent. I have placed the cost of cannel at $10.13; this includes an allowance of 15 cents a ton for breaking, over the expense of breaking caking coal. From actual tests I have found we get one-seventh less coke from Cannelton than from caking coal. This adds 48 cents a ton to the cost of the enricher, making the cannel cost $10.13. In the cost of purification I have placed lime at 9 cents a bushel of 2,150 cubic inches; labor, $1.50 a day; a bushel of lime removing the 1.32 per cent. of carbonic acid from 18,000 feet of gas.

To recapitulate:

Cost of cannel in putting back the 1.03 candles per thousand feet	2.3 cents.
Against this, cost of lime	0.6 cents.
Loss from shrinkage	0.5 "
	1.1 "
	1.2 cents.

—Showing a net loss by leaving the carbonic acid in the gas of 1.2 cents per thousand feet.

Finally, gentlemen, I have ventured to bring this subject to your attention not because it is an interesting theme to the chemist or the physicist, but because it is of interest to us in our every-day duties as practical gas managers, inasmuch as it affects the cost of the product we manufacture.

[Translated for the JOURNAL, by "C. P. C."]

The Bower Recuperative Burner.

[M. Albert Marnier, in *Revue Industrielle*, furnishes the following particulars regarding the mechanism and operation of the Bower-Grimston-Thorp recuperative burner. The illustrations given below are also reproduced from drawings that accompanied M. Marnier's communication to our French contemporary.]

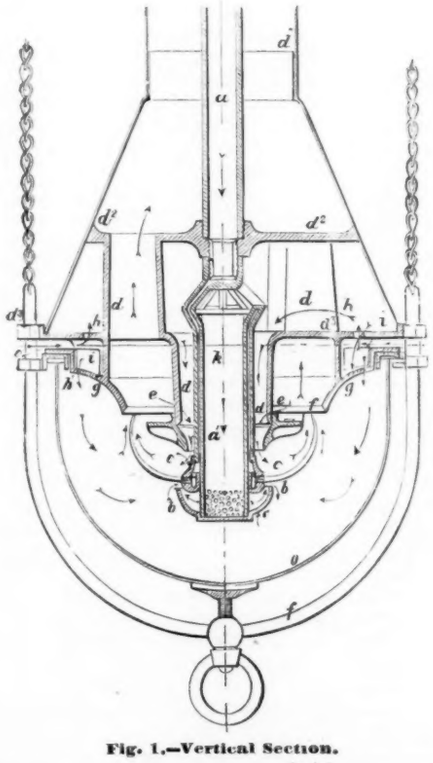

Fig. 1.—Vertical Section.

While electricians are busily engaged in their attempts to effect an economical and practical solution of the problems involved in electric lighting, other and equally persevering and ingenious explorers are pursuing their researches in the field of gas lighting, with a view to securing improved illumination effect by the agency of powerful burners. This competitive rivalry has awakened great interest in the subject, and to this interest must be ascribed the greater proportion of the patented devices which have recently made their appearance. Mr. Bower, by combining or incorporating the best features of the Grimston and Thorp patents with his own, has perfected a

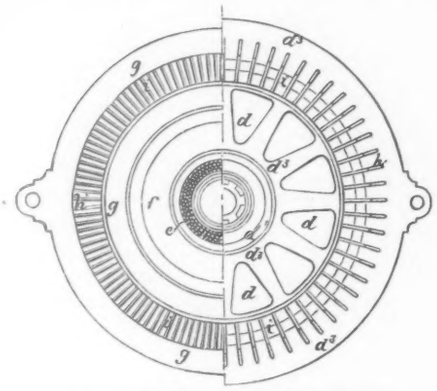

Fig. 2.—Horizontal Half-Sections.

system of intensive burners which, when their principle is thoroughly comprehended, must of necessity be highly thought of by gas consumers in general.

From the diagrams it will be seen that in the Bower lamp the gas descends into a burner having a fixed crown at the middle of the globe. The flame burns above and below the crown, thus forming a veritable ball of light. The

Fig. 3.—Exterior View.

products of combustion escape through a series of heat recuperator tubes placed above the globe. These tubes soon arrive at a red heat, and are surrounded by a series of metallic "winglets"—which are also heated by contact with the gas burned. The cold air traversing these radiating "wing-

lets" is brought to a very high temperature before it reaches interior of burner. A small quantity of warm air circulates on the inside of the globe, preventing it from becoming blackened. A third current, which may be regulated at will, according to variation in quantity of gas being consumed, enters from underneath, gives form to the flame, and supplies the air necessary for combustion. The flame reaches its maximum intensity in about one-quarter of an hour, and the illuminating value varies between 3 and 8 candles for every 27 litres (0.953 cubic feet) of gas consumed. Stated simply, the chief principle of the action is, the heating to a high and uniform temperature of the volume of air necessary for the *complete* combustion of the gas.

The shape of the burner, and the disposition of its accessory parts, however, are not without importance as factors in the increase of illuminating power gained. Figure I. shows a vertical section of lamp; Figure II., showing horizontal half sections, clearly illustrates the method of construction. Figure III. is an exterior view. In the lower section of the apparatus may be noted an air duct which can be opened or closed at the pleasure of the operator.

The gas enters through the conduit a, which terminates in a still larger tube, a', and communicates with interior of burner, b, which is perforated with holes to admit of the free passage of the gas. This burner is made of steatite or any other suitable description of material. A steatite crown, pierced with holes, is placed between two stays, c, one of these being attached to the lower part of the tube, a', while the other covers the circular gas flow pipe, a. This is also surrounded by the heat recuperator, placed, as is usual, above the burner, and is composed of radiating "winglets" forming distinct compartments. The change of temperature between the warm gas and the cold air admitted at e is obtained by a series of vertical tubes, d, brought from the source by means of metallic discs, d_1, d_2, and traversed by the products of combustion before they enter the chimney, d'. Between the recuperator, d, and the burner is placed a tube, d', fitted with a disc, e, pierced with holes. A circular crown at the neck, g, diverts the flame towards the interior. The space comprised within the discs, g, and d_2, is occupied, at i, with a series of divisions or partitions, alternately resting on one or the other of these two discs. The circular space, i, communicates on one side with the atmosphere, connecting on the other side with the first recuperator in such a manner that the crown, i, constitutes what may be termed an auxiliary recuperator.

Examination of the direction of arrows traced on fig. I. shows that the air heated by the first recuperator penetrates into the interior of tube k, and leaves it at its lower part, where it is mixed with the gas, which, as a consequence, gives out a most intense flame. Another quantity of air circulates along the tube d', heats itself through contact with walls of second recuperator, and traverses the grating e, to feed the flame above the burner. The globe o, rests on a support, fx, kept in place by a swinging chain, thus permitting, and without any difficulty, the cleansing of the interior.

According to statements made by the inventor this burner, with a consumption of 425 to 850 liters (15.006 cu. ft. to 30.012 cu. ft.) of gas per hour, gives 8 candles for 28 liters (0.988 cu. ft.), and even better results may be attained if a reflector be used.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, May 9, 1885.

Gas Explosion in London.—The Steam Roller Case.—The Prospects of the Sulphate of Ammonia Market.—Gas Exhibitions.—The Chancellor of the Exchequer and a Proposed Tax on Gas.

Not many months have elapsed since I had to record a disastrous explosion of gas in the southeast district of London, resulting in the wrecking of a small tenement and serious damage to those adjacent; and again I have to call attention to an accident, resulting in very similar disastrous consequences, in the same neighborhood, and affecting a similar class of property. A new thoroughfare had lately been laid down, and a row of small cottages, for the occupation of the artizan classes, just completed; and several months since a 4-inch gas main was put down by the request of the parochial authorities for the supply of a few public lamps, but the gas had not been laid on to any of the cottages. It appears that a row of similar buildings was in process of construction on the opposite side of the road, and the original land, having been found to contain good building sand, was being excavated for the removal of the same, the void being made up with rubbish. The excavation, approaching within a few feet of the gas main, probably weakened the soil below, being assisted in this respect by overflowings and sloppings from a water tub placed close by for the use of the builders. Under these circumstances a heap of rubbish comprising, according to evidence at the inquest (for the disaster was unfortunately attended by fatal consequences), some 20 tons weight, was shot on the surface of the ground just over the gas main. These two causes combined to force the main to sink several inches, and of course resulted in a fracture. The escaping gas found its way into the tenement of the cellar opposite, and at about 8:30 on the evening of the 20th ult. it was inflamed by a little girl going into the cellar with a lighted candle. A tremendous explosion followed, which completely blew out the front and wrecked the whole of the house, the adjacent house being also much shaken and injured. Fortunately, being a quiet bye-street, there were few people about; but the noise of the explosion, which is described as resembling a heavy cannonade, at once drew together a large and excited concourse. The occupants of the unfortunate house, with the exception of two infants who escaped uninjured, were frightfully battered about; one woman has already succumbed, and another is reported as in a precarious state. Of course a regular London crowd assembled, and at once began to avail themselves of the vantage ground offered by the heap of rubbish before mentioned for viewing the ruins, or so much of them as could be distinguished; but they quickly vacated this spot, on account of the fact that, being just over the fractured gas main, it was permeated with gas, which, being inflamed by some means, illumined the whole scene, until the gas company's men succeeded in stopping off the gas—this being effected by breaking the main at some distance away, and stopping up the broken pipe with clay.

There are some people who seem to imagine that every accident with gas is in some some way or other, directly or indirectly, the fault of the gas company; and in connection with this deplorable event there are those who find fault with the way in which the gas mains were laid. Of course a proper inquiry will be held as to the cause of the disaster, and if any negligence occurred in connection with the laying of the main, the same will be fully elicited. No evidence of such, however, is as yet forthcoming, nor is such needed to account for the accident, the cause of which is obvious from the description of the facts above given. Really, when we remember the enormous aggregate length of gas mains in the streets of any large town, and the amount of disturbance to which they are subjected in the course of carrying out sewage and drainage works, excavations for the erection of large buildings, underground railway tunnels, alterations in level of streets, etc.—all of which are carried on with but little special regard to the safety of any gas mains in the vicinity—the fact that the occurrence of accidents from broken gas mains are so few is remarkable. Of course the gas company always have an efficient system of supervision; but it does not seem practicable, in the absence of regulations enforcing contractors to give notice of any work they may be carrying on near to the gas pipes at the office of the company, to devise any system that shall be sufficient to protect the mains and service pipes from interference in the way of weakening the ground below them, or piling heavy weights above. According to the latest Parliamentary return, the three gas companies who divide the honor of supplying London with gas are the proprietors of between 2,600 and 2,700 miles of main pipes; add to this the small connections for consumers, and we may say that the total length of gas pipes in London streets cannot be less than 4,000 miles. An enormous length—equal (following the fanciful method of expressing large quantities that is now so much in vogue in "popular scientific" circles) to one-half the diameter of the earth.

After the contemplation of this disaster, and its melancholy consequences, we turn with increased satisfaction to the judgment delivered in a case which came before the "Supreme Court of Judicature—Court of Appeal" a day or two since. This was an appeal by the defendants against the judgment given in the case of "The Gas Light and Coke Company vs. the Vestry of St. Mary Abbotts, Kensington," popularly known as "the steam roller case," to which I have previously referred (see Vol. XLI., p. 10). The appeal was dismissed with costs, the judgment given by Justice Field being upheld on every point. It will be remembered that the gas company applied for an injunction to prevent the defendants from repairing the road in such a manner as to injure the gas mains—the use of a heavy steam roller being specially complained of, and shown by evidence to have been the cause of several accidents. The Vestry, in defence, claimed they had a perfect right to do what they pleased on the roads for the purpose of repairing them, without regard to the gas mains. The extraordinary argument was advanced that the pipes were there on sufferance at the owner's risk, and if they were broken it was for the gas company to replace them with others sufficiently strong to stand any strain to which they might be exposed. As I remarked at the time, the fact that the leakages might be attended with disastrous and even fatal consequences (as instanced by the accident just described), was entirely ignored by the parochial authorities, who, as the representatives of the public, might naturally be expected to have a keen regard for public welfare and safety. According to the interpretation of the law given by the Lord Chief Justice in pronouncing judgment, it appears that the gas mains are to be respected, and that no process likely to be injurious to them may be used by the highway authorities, unless the latter can show that such process "is expressly authorized by statute." There is no statute authorizing the use of steam rollers, and therefore the case of the vestry falls to the ground. This decision is very important, as it affords a precedent for gas companies to quote, as

securing reasonable care, either on the part of highway authorities or other parties, against injuring the gas mains; it also disposes of the absurd argument that gas mains should be of extraordinary strength, so as to withstand any amount of interference—showing that, on the contrary, all gas companies have to do is to provide for the strains of ordinary traffic, etc., in a reasonable way.

Mr. C. D. McAllum, of Newcastle, is a sort of Job's comforter, as regards the present depression in the sulphate of ammonia trade; which depression, by-the-way, shows no present signs of improvement. Taken with the present difficulty of finding a market, Mr. McAllum's views are such as to cause considerable anxiety to those who, calculating on the returns for residuals that have been obtainable in recent years, have been sailing close to the wind in the matter of the price of gas. In the gas world the intrinsic value of sulphate as a manure has been accepted as a matter of course; and also that it is preferred to its competitor, nitrate of soda; and so it is rather a shock to be told by Mr. McAllum that nitrate of soda is preferred to sulphate, even at a higher price, and that "sulphate is going out of favor for agricultural purposes, because it does not answer well as manure." But sulphate has now been in the market for several years, so it is rather late in the day to be told that it is, if not useless, far inferior to nitrate. Those who have tried it as a manure, and have developed a local trade for it, know better than that. There may be cases where it has not been applied under conditions suited to the requirements; for it is obvious that all artificial manures must be applied with great judgment and skill. Mr. McAllum's complaint against sulphate was comprised in a paper on "Sulphate of Ammonia," read at the recent meeting of the North of England Gas Managers Association; and his remarks were not challenged in the discussion for the simple reason that the subject of the properties of sulphate as a manure was quite novel to the members. The grounds for these opinions do not appear to be the result of practical experience; they are apparently deductions drawn from the relative prices that have respectively been obtained for sulphate and nitrate during the last few years. But I venture to think that, if necessary, plenty of practical proof will be forthcoming as to the value of sulphate as a manure. On account of the low prices many gas engineers are turning their attention to the development of a local trade; as an example of what is being done in this direction I enclose you a circular recently issued by my friend, Mr. Sainsbury, of Trowbridge:

"British Gas Light Company, Limited, Trowbridge.

"SULPHATE OF AMMONIA.

"to farmers, market gardeners, and others.

"Sulphate of ammonia is highly valued as a manure for producing good crops of wheat, oats, etc., and also fine fruit, vegetables and flowers. The British Gas Light Company, Limited, are manufacturers of this excellent manure at the Trowbridge works, and are now selling it at retail, by the cwt., packed in bags, and will forward it, as may be directed, to any address. The price varies from time to time; it is now — per cwt., including the bags, loaded into carts at the works, or railway trucks at Trowbridge railway station.

"The following are the proportions in which it should be used: For grass land; about 1½ cwt. per acre, to be put on the land before or after a shower of rain. For wheat, oats, and barley; about 1 cwt. per acre for wheat; about 1 cwt. per acre for oats; about 1¼ cwt. per acre for barley. For vines; 1 bushel on the vine border, and lightly fork it in, in the months of March, April, May and September. This quantity (1 bushel) to be for the nourishment of four vines. For onion beds; give a good sprinkling over the beds two or three times during the growth of the onions. For potatoes; about 1½ cwt. per acre, as a top-dressing, before the haulms appear above ground. For greenhouse plants; a large teacupful in a bucket of water, to water the greenhouse plants with twice a week. Not to be used, however, for heaths, rhododendrons, or orchids. For peach, apricot, plum, currant, and gooseberry trees; a similar solution to that given for greenhouse plants, in the months of March, April and May. Rose trees and garden plants are benefited by the use of the solution. Celery, cabbages, and cauliflower also grow well when watered with the solution. For raising healthy plants from seeds; sprinkle a good quantity of the sulphate on the seed beds, and then water them a week before sowing the seeds. Melons and cucumber plants are likewise much benefited by sulphate of ammonia. By the use of sulphate of ammonia vegetation is rendered more healthy, and consequently less liable to the destructive attacks of the scavengers of nature, especially if used in the spring of the year, when vegetation requires a condensed antiseptic food and nourisher to enable it to withstand the blighting effects of the northeasterly winds."

Gas exhibitions appear to be more than ever in the ascendant this season, and a large number were held during the past month. The most notable is that held at Carlisle, under the auspices of the Mayor and Corporation. There is every reason why such should pass off satisfactorily in that town, for the gas works is the property of the Corporation, and consequently the gas consumers are made to find the money for all sorts of public improvements that otherwise would have to be paid for out of the rates. The proceedings comprised lectures, by Mr. Harold B. Dixon, on "Gas light and gas heat;" by Dr. Stevenson Macadam, on the "Sanitary aspects of heating and cooking by gas;" and a course of lectures on cookery, by Mrs. Thwacks. There is something attractive about the easy way in which these lady lecturers peel apples, roll out pastry, and perform other operations without the slightest hitch in their fluent expositions on the matter in hand; and lectures on cookery are a decided attraction in connection with any gas exhibition. A well-arranged scientific lecture, illustrated by experiments, is also sure to be well received, and both Mr. Dixon and Dr. Macadam are well-known as adepts at this sort of thing. But the exhibitions are not confined to our principal towns; they are being held at small places numbering only a few thousand inhabitants, and in all cases appear to be attended with success.

On one evening last week I noticed that the chancellor of the exchequer, in referring to suggested means for raising additional revenue for the country, amongst others, by a tax on gas and illuminating oils, expressed a decided opinion on this latter subject, and one which will be received by the gas interest at large with much satisfaction. He said: "I will have none of these taxes; I strongly object to have anything to do with the imposition of taxes on raw materials or the necessaries of life, whether food, or the means of warming and lighting." For some years past the government has been in the habit of demanding an annual return from statutory gas undertakings, setting forth the principal facts in connection with their year's working; and, indeed, forming almost as full a report on the condition of the undertaking as a shareholder could wish for; and some curiosity has from time to time been expressed as to the object in view in demanding so full a return. The possibility of a tax on gas has more than once been hinted at, since such a proceeding is known to be regarded in a favorable light in certain influential quarters; and the above unmistakable expression of opinion from the chancellor of the exchequer will be received with much acceptance by those who have seen reason to anticipate such a drawback to the advancement of the gas industry and interests.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Mister Gibbs "Gets Left."—In our last issue we had occasion to mention that W. W. Gibbs (he of the United Gas Improvement Company, of Phila., Pa.) brought suit to recover the sum of $50,000 as compensation for services he had rendered the Consolidated Gas Light Company, of Baltimore, Md., in patching up a truce, between the officials of that corporation and the managers of the rival (the Equitable) company, as to the war of gas rates that prevailed there some time ago. We ventured the assertion that Mister Gibbs would not be likely to get any of the money, and now we can say that he won't. On May 14th Judge Morris, of the United States Circuit Court, before whom and a jury the case was to be tried, took the case out of the latter's hands, by ruling that the truce contract between the two gas companies was null and void, consequently the plaintiff had no standing in court, since his assumed "services" had resulted in nothing other than an illegal agreement. Messrs. Morrison and Bond, of counsel for Consolidated Company, submitted briefs showing that the Equitable Company's charter expressly forbade the action which Mister Gibbs was at such "great pains" to accomplish. Section 4, chapter 328, acts of 1882 (really a supplemental act to the charter of the Equitable Company), provides, "That the said company be and hereby is prevented from entering into any consolidation, combination or contract with any other gas company whatsoever; and any attempt so to do, or to make such combinations or contracts as are herein prohibited, shall be utterly null and void." The substance of the agreement, now declared null and void, is, substantially, as follows: The two companies were to raise the price of gas to $1.60 net per 1,000 feet, and the Equitable was not to make any further main extensions; both were to pool the net profits derived from all new business, the profits subsequently to be divided in a certain proportion, and the Equitable was to pay interest on the cost of the plant necessary to secure such new business. They were also to pool their entire receipts from the old business, the sum of same to be divided in certain proportion. Each company was to look after its own securities. A forfeit of $250,000 was the penalty incurred by the company first to break the contract. President Hall, of the Consolidated, testified, "he did not consider the agreement, as made, desirable to his company." Now, it would seem as though the latter gentleman might be right in so thinking, especially since the Chesapeake opposition promoters might incline to the idea that the "agreement" would be decidedly favorable to their operations. It is a pity that the "true inwardness" of this Chesapeake "deal" cannot be brought to light, although the "lapse of time" may be counted on to show up some of its leading features. To return to Mister Gibbs: That eminent apostle of carbonic oxide had no trouble in convincing the Equitable managers that his services as mediator should be recompensed, and they immediately handed him over

$50,000—in cash? our readers ask. Well, no; not exactly. They gave him $50,000, at *par value*, in the stock of the Equitable Company. We ventured to suggest in our number for May 16th that Mr. Gibbs' hair would become pretty thin before he got a verdict, and the decision of Judge Morris, as given above, amply confirms the prognostication; but just think how venerable Mister Gibbs will be in appearance by the time he has had an opportunity to ask his bankers to cash a dividend check, the figures whereon may be taken to represent money earned by the Equitable Company as a seller of gas! He would be able to dispute seniority with Methusaleh. Taking a calm survey of the situation, it would seem as though Captain Hall, of the Consolidated Company, has a little the best of his opponents—be they either connected with Gibbs, the Equitable, or the Chesapeake opposition.

The Death Roll.—Case No. 1 Looks Like a Suicide.—On the morning of May 1st Adolph Glackmeyer was found dead in bed in his room at the Rochester Hotel, No. 114 Bleecker street, New York city. The room was filled with gas that had escaped from a turned-on burner. While there had been no attempt made at closing up the crevices at door and windows to room—in fact the transom was ajar to the extent of a couple of inches—from the fact that Glackmeyer, who was personally unknown to the proprietor of the hotel, had registered under an assumed name, that he had been suffering for months from a pulmonary disease, that on two prior occasions he had attempted to commit suicide by taking poison, and that his domestic relations had been very unhappy—all these things were brought to light within a day or two after his death—it was surmised that the unfortunate man had determined to end his life, and with that purpose in view went to bed after having blown out the gas.

Case No. 2.—On evening of May 19th Jno. Devine registered at the new Clinton Hotel, Kokomo, Ind. He retired to his room, and some three or four hours afterward the smell of escaping gas attracted the notice of a hall porter. The search ended at door to Devine's apartment. A forcible entrance developed the usual state of affairs. Devine was a corpse, and his death had resulted from asphyxiation caused by the inhalation of illuminating gas. The old story of blowing out the gas is once more repeated. When the Kokomo folks made coal gas their product never killed anybody.

Our English Contemporary Thinks So Too.—The *Journal of Gas Lighting*, of date of May 5th, devotes over two columns of its space to an ably-written (indeed our brilliant contemporary is ever noted for the ability and impartiality with which it discusses any topic) review and commentary upon the now famous report,* made by Profs. Sedgwick and Nichols, of Massachusetts, in regard to the poisonous qualities of water gas. It is with a feeling of genuine pleasure that we note our contemporary ranges itself on our side of this matter; and we suppose that the patent-right sellers on this side of the Atlantic will have the decency (we do not expect them to acquiesce on the score of common sense or honesty) to admit that the London *Journal*, voicing as it does the opinions of writers like King, Weber, Fewtrell, Newbigging, Humphrys, and others, takes its standpoint from no other basis than a wish to promote the best interests of the gas maker. We would recommend that all our readers should peruse this calm judgment of our London contemporary, and regret that the pressure upon our columns is so great as to prevent us from republishing it in full. We cannot forbear, however, from reproducing the final statement made by our English *confrere*, which is as follows: "Upon general principles, the promiscuous sale of gaseous poison seems to require to be checked as much as the irresponsible dealing in arsenic by a quack apothecary. It is impossible to read the narratives of casualties arising from the inhalation of water gas by inexperienced hotel visitors and domestic servants without an unpleasant impression that these occurrences should be more fully investigated than seems to be the rule. Speaking plainly, it appears that the presence in a sleeping apartment of a burner supplied with water gas is a facility for murder that should not be permitted in a civilized land. It is unnecessary to pursue this part of the subject; but the mere suggestion of the nefarious use to which water gas lends itself so readily, and with the slightest possible risk of discovery, should be sufficient to exclude it not only from France and Massachusetts, but from every other State on both sides of the Atlantic."

Trumping Up Charges of Labor Troubles.—The Newark (N. J.) daily newspapers, probably at a loss for some local sensational matter, determined to have a fling at the Newark Gas Light Company, thereby seeking to bring down "two birds with one stone"—in the first place hoping to point the "finger of public scorn" at a bloated monopoly, with the second object of posing as the true "friends of labor." Oh! yes. The true friends of labor, certainly. If these very self-appointed conservitors of Newark's laboring classes would only publish the prices at which they "remunerate" their own compositors and pressmen perhaps their remarkable disinterestedness might not seem so apparent. At any rate, the "formers of public opinion" indulged in an outcry at a recent reduction in the wages of the employees of Mr. Vanderpool's company, and raised a sort of dismal howl about the uncalled for dismissal of several of the men. How much of truth was contained in the assertion may be understood from the following; and bear in mind that the "sleuth-hounds of the press struck the scent" on or about the middle of May: On January 3d, 1885, the Newark Company made a reduction of 25 cents (or from $2.50 to $2.25) in the pay of some of the hands. It was the first reduction made in some years, and the Newark folks could now readily fill the position of every similar class of "hand" in their works at a cost of $2 per day each. No reduction beyond that of January was at any time contemplated. On the contrary, since then the pay of certain hands in some other departments of the company's plant has been increased. The tasks allotted to the men have not been in any way added to. Since January 1st ten removals have been made—and every one of those dispensed with had given sufficient cause for the action taken. The sleuth-hounds have evidently been "barking up the wrong tree."

Certainly; Why Not?—A trifling light has been vouchsafed us in regard to that mysterious "Avery Gas Company," since we announced the filing of its certificate of incorporation as given in our last issue. The "company" has held its annual meeting. It took place on the 19th of May, and the officers selected to preside over its destinies were: E. P. Cone, president; J. W. Kones, vice-president; A. F. Learned, secretary; and J. W. Bartlett, treasurer. A representative of the Journal was gravely informed that the company owns a new gas process which is well calculated to revolutionize the gas business of the country; but like unto that incandescent light of the great Pennsylvania balloonist professor, and that other wonderful "scientist of Penn's land" "Prof." Keely, the particulars regarding "the composition of the materials" are withheld until the proper period arrives. The last hope of the coal gas man hath vanished! Certainly; why not?

How a Reverend Gentleman Looks Upon Different Lights.—The Rev. Dr. Howard Crosby has been turning his pious thoughts toward "light," and his opinion is thus made manifest. The gentleman has been manufacturing light on his own account; but he has only thus far succeeded in illuminating the pages of a book with the homebred product. The book bears the title of "Kindly Light"—it is a right good book, too—and an advertisement of its excellencies bears an imprint of the quotation, "It is a softened sunlight that carries healing on its wings." Now, of course, if Dr. Crosby did not think his light was as it is represented in that "ad." he would immediately order his publishers to stop making the assertion. So much for the Doctor's own "light;" and here is what he thinks of the Consolidated Gas Company's light—an excellent, good light it is too—in particular, and other gas lights in general; for so he wrote during the "Sherwood boom" of fragrant memory: "Our gas companies have been plundering long enough. They should be squeezed like leeches to give up the blood they have sucked." "How sweet is charity," etc. The Doctor must have been troubled with indigestion at about the time he penned those elegant and forceful words.

More Investigations.—The Senate junketing committee that "investigated" the New York gas companies early last spring must have had such a pleasant time at the Morton House as to make others of their august body anxious to try a hand at it. At least this inference might be deemed fair from the closing proceedings at Albany, N. Y., on date of May 15th last, for President McCarthy appointed Senators Gilbert, Robinson, and Murphy as a special committee to "investigate the consolidation of the New York gas companies." Why, we thought, judging from previous assertions made on the floor of the Senate, and just at the time when that 19 to 1 affirmative vote was taken on the "New York Gas Commission bill" (otherwise the "forty thousand dollars per annum job"), that Sherwood & Co. had posted the lawmakers in every particular. It seems not, though. If the special committeemen have power to take testimony whenever they like and wherever they elect, we would suggest July and August as the months and Long Branch as the place. The Monmouth Park racetrack is convenient to the "Branch," the sport is always good, and poolselling is not interfered with "down that way." Furthermore, Mr. Withers, G. and P. Lorillard, Peabody Wetmore, and J. G. Bennet (the owners of the track) are understood to be more or less interested in gas stocks. If they cannot take testimony in New Jersey, they could hold the seances up at Saratoga, where the conditions are pretty much the same as those at the "Branch." Who could blame them for combining business with pleasure?

The Cost of Operating a Gas Assaying Furnace.—Prof. Torrey says that the expense of running a specimen of the Reichhelm gas assaying furnace (in use for some time in the assaying department of the United States sub-treasury building on Wall and Pine streets in this city), carrying a muffle of 7 by 12 inches, is about ten cents an hour, with gas costing $1.50

* See Journal, March 16, pp. 148-9.

per thousand. This shows an hourly consumption of about 66 cubic feet. The estimate was made up from the average of one year's experiments.

Nominating an Inspector of Gas Meters.—Governor Hill, on May 14, handed in to the Senate for confirmation as official inspector of gas meters for New York city the name of Mr. William O'Brien. The nominee's principal qualification for the position appears to be the fact that he is the nephew of the Hon. "Jimmy" O'Brien. We do not know what action was taken by the Senate on the nomination, the Secretary of State never having troubled himself to answer our communication in regard thereto. And yet we are told that "public office is a public trust."

How They Trust One Another.—On June 19, 1884, a serious fire occurred at the works of the Bloomington (Ills.) Gas Light Company (it was reported in Journal of July 2), and on the representations of Mr. C. D. Hauk—at that time manager of the Bloomington plant—that the accident arose from a defect in the apparatus furnished by A. O. Granger & Co., the latter firm made good the loss sustained by the Bloomington folks, and to do so incurred an expense of $1,200. Granger subsequently made a quiet investigation of the case, and this resulted in apparently showing that the negligence and foolhardiness of the Bloomington employees had brought about the catastrophe. Granger accordingly entered suit to recover the expense he was put to in repairing the plant. After a trial of the case Granger was awarded a judgment in the sum of $1,215.18. And yet "these be all honorable men." It might here be casually noted that Mr. C. D. Hauk is supposed to be backed by a wealthy firm of Springfield (Ohio) manufacturers.

Striving for an Increased Summer Consumption.—The Covington (Ky.) Gas Light Company's managers intend to sell some gas this summer. They are urging upon their consumers the benefits to be derived from an intelligent use of gas cookers, and have also decided to make a discrimination in selling prices between gas used for cooking and that employed for lighting, with a view toward fostering an enlarged consumption of the former class of output. Gas used for illumination is scheduled at $2 per thousand; that for cooking and power at $1.50.

Montgomery (Ala.) to do Likewise.—Mr. T. Gardner Foster, Manager of the Montgomery Gas Light Company, recently informed us that his company will make a persistent attempt to introduce gas for cooking purposes with this summer; indeed, he has already gone at the work with vigor. A discriminatory rate will be made, but the exact figures have not yet been fixed upon.

Gas Turned On at Los Gatos, California.—Gas was turned on to the mains of the Los Gatos Gas Light Company, for the first time, on the evening of April 15. The appearance of the illuminant was made the occasion of public rejoicing there. Mr. M. G. Elmore, the organizer of the company, as also constructor of its plant, made the first overtures toward the institution of the corporation on about the middle of January. The project received hearty support from the start, as, indeed, the fact that gas was sent out in three months from the time the enterprise was broached amply proves. Of course, the works are small; but the town, although a live place, is only possessed of about 5,000 souls. The plant has a per diem capacity of 15,000 cubic feet; but we would suggest to Mr. Elmore that, even though clay retorts were very expensive out in that section of the country, and that he would be obliged to wait some time for their delivery, prudence would certainly have accepted both these alternatives rather than employ the iron vessels really put in. The capital stock of the Los Gatos Company is fixed at $50,000, of which $17,500 has been paid in. Mr. Gilbert Clayton has been selected to assume the post of Superintendent.

Waiting for the Improved Machines.—Lynchburg (Va.) Councils awarded a partial contract for the night lighting of that city "quite a long while ago," to a concern called the Piedmont Electric Illuminating Company. Having had time enough to do the work of installation at least ten times over, the city fathers at last became impatient to know when the moons were to shine; and in response to their formal inquiry Mr. E. Grening, Manager of the Piedmonnt, etc., wrote back in reply that his company had purchased their dynamos and lamps from the "Brooklyn Electric Construction Company," and as these specimens of the craft of the electrical constructor were not adapted to run well when impelled by water power (it is proposed to use hydraulic power at Lynchburg), hence the delays in perfecting the system, etc. Mr. Grening concludes his plaint by "craving the indulgence of your Common Council for but a few days longer." If the Council were wise they would grant Mr. Grening an indefinite postponement, and so save the taxpayers their money.

No Electric Light for Poughkeepsie, N. Y.—Mr. Allen, of the Citizens Gas Light Company, of Poughkeepsie, has finally vanquished the American Electric Lighting Company in the latter's attempt to secure a portion of the street lighting. On the evening of Monday, May 12th, the City Council voted to contract with the Citizens Company for the entire street lighting during 1885, on the following basis: 160 lamps at $23 each, and 461 lamps at $31 each, or a total contract price of $17,971. No charge is to be made for gas supplied to public buildings. This latter is a rather queer policy, even though the cost of gas consumed in the public buildings is estimated at but $500 for the twelvemonth. Indeed, we do not see on what grounds Mr. Allen can justify the movement; it certainly cannot be because the gas he sells is worthless.

Is it a Job?—On the evening of Thursday, May 7th, the Troy (N. Y.) Common Council passed a resolution granting Messrs. G. S. Geer and Chas. McCarthy permission to lay pipes for the transmission of non-illuminating gas to be employed in domestic and mechanical operations as a fuel agent. It is understood that the grantees of the privilege awarded propose to utilize, as far as possible, the mains of the defunct Troy Steam Heating Company, and, further, that they intend to employ the Lowe system. Everybody knows how the sharks of the United Gas Improvement effected a partial entrance and lodgment into the St. Louis (Mo.) Gas Company's territory under the false pretense that they intended to manufacture and sell a fuel gas only. The words and promises of such men go for naught—they are best judged by their acts; and it will stand the Troy (N. Y.) Gas Company in good need if they watch Mr. Geer pretty sharply. He will bear it; and the scrutiny will not be thrown away.

Station Meter Blown Up.—At 10 A.M., on May 20th, while three workmen were employed in making search for a defect that was supposed to exist in a station meter located at the Second and Convent street station of the St. Louis (Mo.) Gas Light Company's works, one of the men, it is supposed, poked a candle into the dry well of the meter, and a tremendous explosion ensued. Two of the men (named Burns and Doran, respectively) were instantly killed, while the third (Killian) although badly injured, will recover. The meter had been out of use since last January. Superintendent Lansden had given the men strict injunctions as to how they should proceed—in fact he had probably not been away from the spot over five minutes when the explosion took place. The coroner's jury, after listening to Killian's testimony at the trial held on May 21st, exonerates the gas company's superintendent most completely from any sort of negligence in the premises. The loss is put down at $10,000.

Gas War at Austin, Texas.—The latest trace of our erratic traveler, B. Van Steenbergh, crops out at Austin, Texas. At that point our wandering hero is in control of the fortunes of an opposition concern called the Capital Gas Light Company. He has "piped" the paying portion of the city, and given notice that from and after May 1st the opposition jugglers would be ready to deliver gas at $1.25 per 1,000 cubic feet. Mr. Judge, Secretary of the old Austin Gas Light and Coal Company, met the cut in that section of the city by offering to supply consumers in the disputed district at the rate of $1.50, and further notifies his customers that should they think of making a change they had better call at the office of the old company, and so probably save money. We think we can rely upon Mr. White, of Houston, to keep us posted as to the doings of the Austin branch of the Van Steenbergh (how like it is to Van Amberg) menagerie.

The Market for Gas Securities.

At present hour of writing (noon, May 29th) the quotations on 'change show Consolidated gas at 98¾ bid, offered at 99. In last number of Journal we predicted that Consolidated would about reach par before Decoration Day, and were not very far out of the way in the assertion. Sales were made some two or three days ago at as high a notch as 99¾, and the total transfers for the fortnight aggregate somewhere in the immediate neighborhood of 3,600 shares. We also stated that a dividend of three per cent. would shortly be declared; but we were out of our reckoning slightly, since, on May 27th, the management published the announcement that on June 16th the Consolidated Company would pay a 3½ per cent. return to its stockholders. The transfer books will be closed on June 5th. Equitable is in the "dumps," and is now offered at 122½. We gave pretty good advice with regard to this security in our last market report. Mutual holds its own fairly well. Brooklyn shares are sluggishly inclined. Baltimore Consolidated is down to 47. Washington (D. C.) gas keeps very steady. St. Louis (Mo.) gas is rated at 775 bid. All classes of Eastern gas shares are fairly well held. Muller, New York city, recently sold the following lots at auction: Peoples (Brooklyn), 800 shares, at 81 to 81½; 100 shares Brooklyn, at 126; 1,312 shares Nassau (Brooklyn), at 120½ to 121½; and 20 shares Havana (Cuba) Gas Light Company's stock, at 12½. Nothing else of interest, unless it be to say that, with gas at a dollar a thousand, the Louisville (Ky.) Company can earn about 5½ per cent. on its capital.

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Engineer's Office, Louisville (Ky.) Gas Company.

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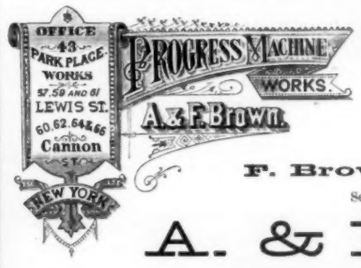

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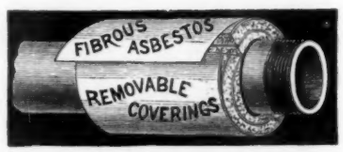


These goods are used at Continental Works, Br'klyn.

CHALMERS-SPENCE COMPANY, 419 & 421 EIGHTH ST., N. Y.

Parson's Steam Blower,
FOR IMPROVING BAD DRAUGHT IN BOILERS, AND FOR BURNING BREEZE OR OTHER WASTE MATERIAL.

PARSON'S TAR BURNER,
FOR UTILIZING COAL TAR AS FUEL.

PARSON'S AIR JET TUBE CLEANER,
FOR CLEANING BOILER TUBES.

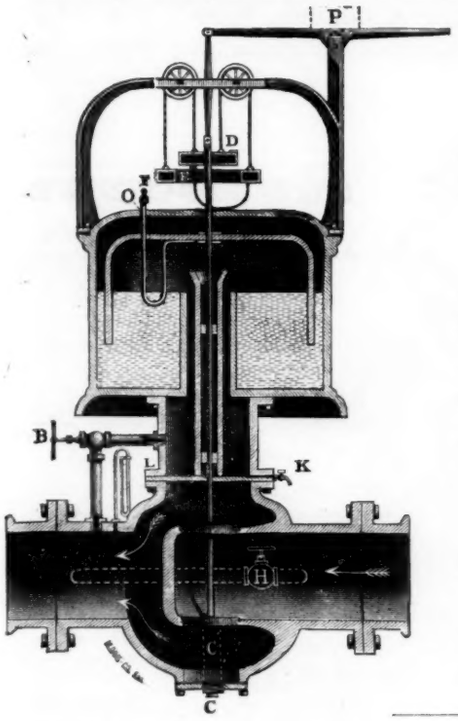
These devices are all first-class. They will be sent to any responsible party *for trial*. No sale unless satisfactory. Manufactured by the WATERTOWN STEAM BLOWER COMPANY.

H. E. PARSON, Supt., 42 PINE ST., N. Y.

Connelly's Automatic Gas Governors,

FOR STREET MAINS.

The Only Strictly Automatic Gas Governor in the Market! No Weights! No Clock! No Attention Required!



Will respond instantly, WITHOUT VIBRATION, to changing pressure from Telescopic Holders, or to any sudden increase in consumption, however large; which cannot be said of any other Governor. It is this feature that enables us to claim it to be

THE ONLY PERFECT AUTOMATIC GAS GOVERNOR EVER MADE.

It will control and regulate the pressure to suit the variation in consumption with perfect accuracy and absolute reliability. It will respond instantly to any unusual demand during the day or night, increasing volume and pressure together, and reduce same to the minimum as the lights are extinguished. It does away with all necessity for watching changes in the weather, or extra occasions of unusual demand, and insures the pressure being the exact amount required at all times.

We unhesitatingly claim our "Automatic Governors" to fill every requirement. They are simple in construction, cannot get out of order, will not corrode, occupy but little room, and can be placed and adjusted by anyone. They are capable of a wide range of adjustment, and can be set to any maximum and minimum pressure desired.

The accompanying cut shows the pressure held in the Columbus, Ohio, gas mains by one of our 16-inch Governors, the *light line* showing the pressure held during Friday, April 24th, 1885, and the *heavy line* pressure held Saturday, April 25th, 1885; the *two lines* showing the actual service of the Governor under varying demands. The accompanying letter from Mr. McMillin attests its wonderful perfection in very brief terms:

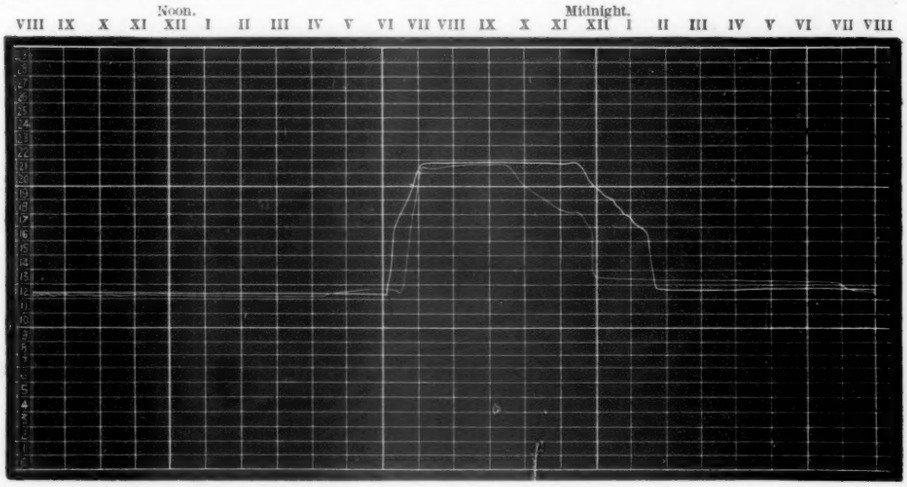
Pressure in Street Mains at Columbus Works.

COLUMBUS GAS LIGHT & COKE CO., COLUMBUS, OHIO, April 28, 1885.

MESSRS. CONNELLY & CO., LIMITED, No. 407 Broadway, New York:

Gentlemen—We have had one of your Automatic Governors in use for some months, and are well pleased with it. No attention is required more than to give it a few drops of oil once a week. The register card it makes clearly indicates the character of the weather, whether clear or cloudy. It puts three or four tenths less pressure on Sunday night than on other nights of the week, and takes the pressure off two or three hours earlier. In other words, *it supplies the demand*—no more and no less. Yours truly,

E. McMILLIN, Superintendent.



In calling the attention of our friends and patrons to our Automatic Governor we do so in full confidence that it will give most thorough satisfaction, and pay for itself in from one to ten months (depending upon the percentage of leakage), which any manager can easily estimate for himself. Certainly nothing can be placed in a gas works to-day that will pay for itself so soon. Correspondence solicited.

No. 407 Broadway, New York City. CONNELLY & CO., Limited. 33d & Smallman Sts., Pittsburgh.

New England Agent, C. H. SPRAGUE, 70 Kilby Street, Boston.

THE CLERK GAS ENGINE.

Highest Award American Institute, New York, 1883. Silver Medal American Institute, N. Y., 1884.
Cold Medal Awarded Crystal Palace Electrical Exhibition, London, 1882.
Highest Award for Motive Power British Section International Exhibition of Electricity, Paris, 1881.

Reliable.

No Boiler.

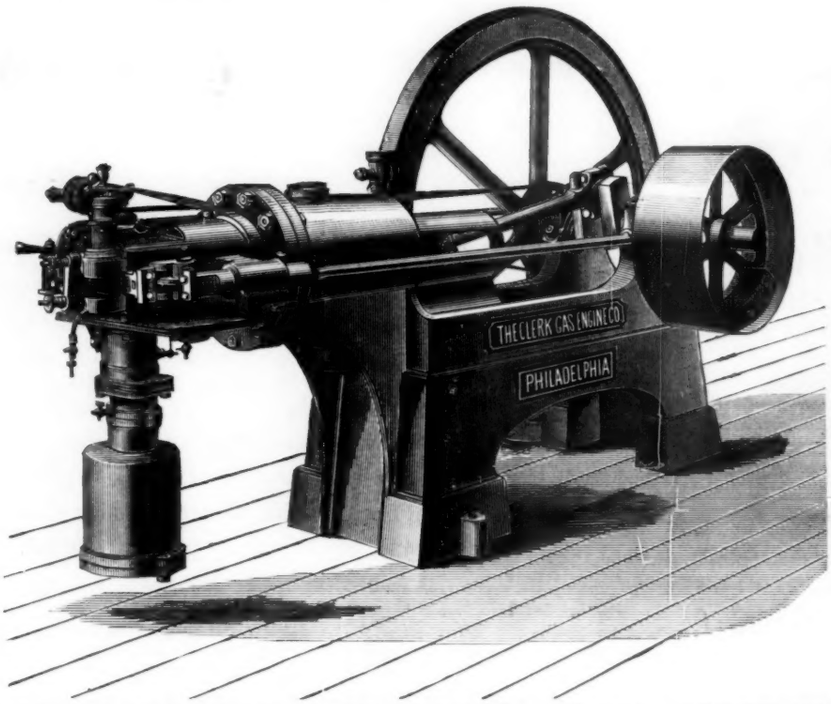
Steady.

No Coal.

Simple.

No Ashes.

Compact.



Economical.

No Engineer.

No Explosion

No Gearing Wheels.

No Danger.

No Parts requiring frequent renewal.

REQUIRING ONLY A MATCH TO START IT--GIVING ITS FULL POWER IMMEDIATELY.

We would inform the public that during the last few months we have improved THE CLERK GAS ENGINE to such an extent that we can now offer an engine vastly superior to our former pattern. These improvements have enabled us to sell our engine at a GREATLY REDUCED FIGURE, partly on account of the decreased weight (our engine weighing about half that of others giving the same Brake H. P). The consumption of gas has been decreased to a considerable extent, and the Brake H. P. has been increased some 25 to 30 per cent. All parts of the old design that were considered defective have been remodeled and new designs added. We now have an engine second to none as regards power, consumption, and ease of working. With our new engine all trouble in starting has been removed, the noise reduced to a minimum, and the regularity of motion is now all that can be desired. We guarantee all we claim for it, and the material and workmanship being of the best, enables us to guarantee the engine for twelve months.

SOLE MAKERS,

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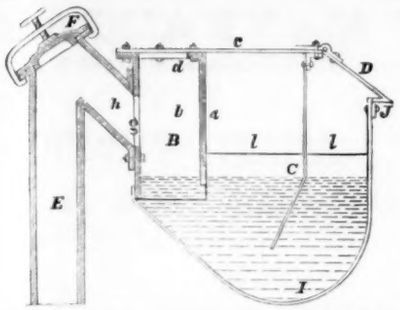
Of Philadelphia, New York, and Chicago.

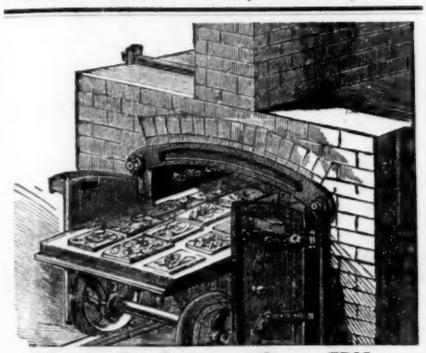


Boardman Hydraulic Main,

Patented October 7, 1884.

For description, see AM. GAS LIGHT JOURNAL of Feb. 2, 1884.
For terms, apply to

A. E. BOARDMAN, Macon, Ga.



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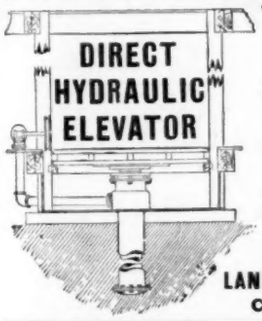

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Largely used by Leading Gas Co.s for Coal and Coke Lifts.

Adapted for use with city service, or special pumping and accumulator system. For prices address the

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MANUFACTURERS OF

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GLOBE LAMPS.

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Gas Companies and others intending to erect lamps and posts will do well to communicate with us.

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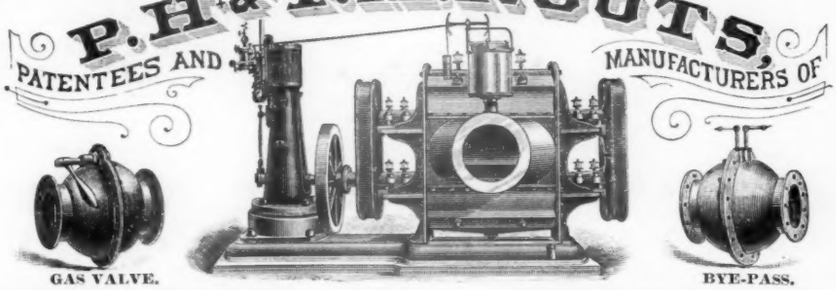

GAS VALVE. BYE-PASS.

IMPROVED GAS EXHAUSTER,

WITH ENGINE ON SAME BED PLATE, OR WITHOUT.

BYE-PASSES, GAS VALVES, GOVERNORS, ELBOWS, PIPE-FITTINGS, Etc., FURNISHED TO ORDER,

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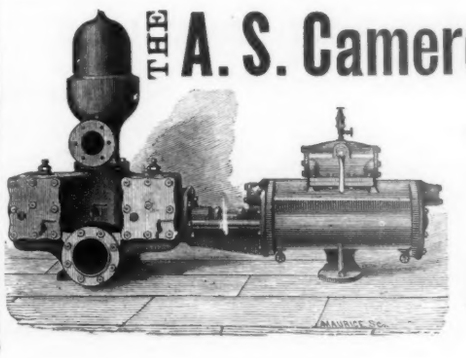
SEND FOR ILLUSTRATED CATALOGUE AND PRICE LIST.



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Upward of 30,000 in Use.

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Ever Introduced.

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Clay Gas Retorts,
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AND EVERYTHING IN THE FIRE CLAY LINE.

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OFFICE AND FACTORY,
Clark, Forty-Fifth, and La Salle Streets,
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GEORGE C. HICKS, Pres. PAUL P. AUSTIN, Sec. & Treas.
STANDARD
Clay Retorts and Settings.
BLOCKS & TILES
Of every Shape and Size to Order.
Standard Fire Bricks.

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Works,
LOCKPORT STATION, PA.
—ESTABLISHED 1864.—
WILLIAM GARDNER & SON,
Successor to GARDNER BROTHERS.
WILLIAM GARDNER.
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Clay Gas Retorts, Fire Brick, and Fire Clay Goods of Every Description.
Plans of Livesey-Somerville, McIlhenny, and other Furnaces, and Competent Workmen Supplied.

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Manufacturers of Gas Retorts, Retort Settings, Fire Brick, Tiles, Etc.

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GAS RETORT & FIRE BRICK
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PARKER, RUSSELL & CO.
City Office, 711 Pine Street,
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Our immense establishment is now employed almost entirely in the manufacture of
MATERIALS FOR GAS COMPANIES.
We have studied and perfected three important points. Our retorts are made to stand changes of temperature, the strongest heats of the furnace, and the abrasion of feeding and emptying. Ou customers are in almost every State of the Union, to all of whom we refer.

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BALTIMORE
RETORT & FIRE BRICK CO.
MANUFACTORY AT
LOCUST POINT, BALTIMORE, MD.
Connection with the City by Telephone.
Clay Retorts, Blocks & Tiles,
FIRE BRICK, FIRE CLAY,
AND FIRE CEMENT.
Red and Buff Ornamental Tiles and Chimney Tops. Drain and Sewer Pipe (from 2 to 30 inches). Baker Oven Tiles 12x12x2 and 10x10x2.
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Nos. 244 & 246 North Wells Street, Chicago, Ill.

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No. 177 Elm Street, Cincinnati, Ohio. Nos. 122 & 124 Sutter Street, San Francisco Cal.

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NEW DESIGN STOVES MADE IN CAST IRON, WITH EITHER OPEN OR CLOSED TOPS.

In presenting our "Economy" Gas Cooking Stoves and Ranges for the Season of 1885, we have the pleasure to inform our patrons that the increasing demand for these Stoves has encouraged us to make entirely new patterns, of Highly Ornamental Designs, for the popular sizes. We have also embraced the opportunity to increase the size of these Stoves, giving greater Top Plate and Oven capacity.

Full Lists and Catalogues are in preparation, and large stocks of Stoves will be kept at our Manufactories and Agencies for prompt shipment.

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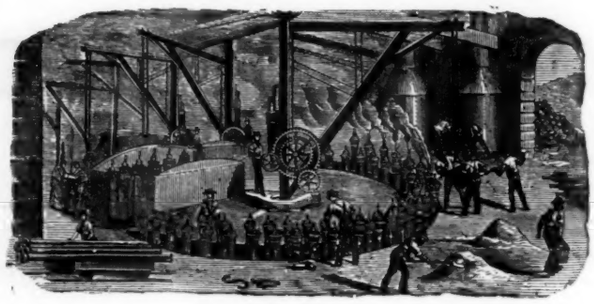

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CAST IRON PIPES

FOR WATER AND GAS.

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Cast Iron Gas & Water Pipes, Stop Valves, Fire Hydrants, Gasholders. &c.

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Cast Iron Water and Gas Pipe

FROM TWO TO FORTY-EIGHT INCHES DIAMETER.

ALSO ALL SIZES OF

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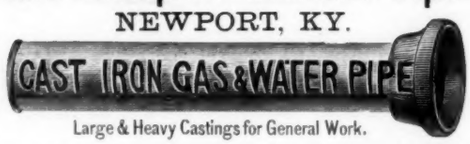
NEWPORT, KY.

Lamp Posts AND **BENCH CASTINGS** A Specialty.



Large & Heavy Castings for General Work.

Branch AND **SPECIAL CASTINGS** FOR GAS & WATER CO'S.

Manufacture Pipe from 2 to 48 inches. All work guaranteed first quality.

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Limited. Established 1848.

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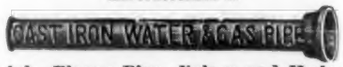

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Machinery and castings for Furnaces, Rolling Mills, Grist and Saw Mills, Mining Pumps, Hoists, etc.

GENERAL OFFICE, - - - READING, PA.

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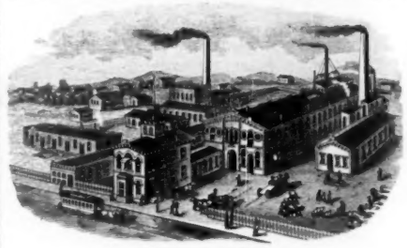

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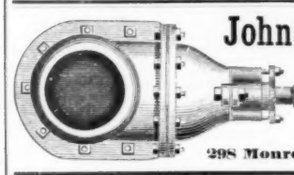
Hydraulic Main Dip Regulators, also Check Valves, Foot Valves, Yard-wash and Fire Hydrants. Send for Circulars.

Valves.—Double and Single Gate, ¾ in. to 48 in., outside and inside Screws. Indicator, etc., for Gas, Water, Steam, and Oil. ani for Circulars.



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Advantages of the Strap File.

1st. It is simple, strong, and easily used.

2d. Preserves papers without punching holes.

3d. Will always lie flat open.

4th. Allows any paper on file to be taken off without disturbing the others.

Price, $1.25. Sent either by express or mail, at directed. By mail the postage will be 20 cents, which will be added to the price of the Binder.

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Siemens's Regenerative Gas Burners,

For Lighting and Ventilating.

THE CHEAPEST, PUREST, AND MOST BRILLIANT OF ALL GAS LIGHTS.

Superior to the Electric Light in Economy, Beauty, & Steadiness.

SPECIALLY ADAPTED FOR LIGHTING HALLS, FACTORIES, OPEN SPACES, ETC.

Numerous Tests made by various Gas Companies in the United States show an Efficiency of Ten Candle Power per Cubic Foot of Gas.

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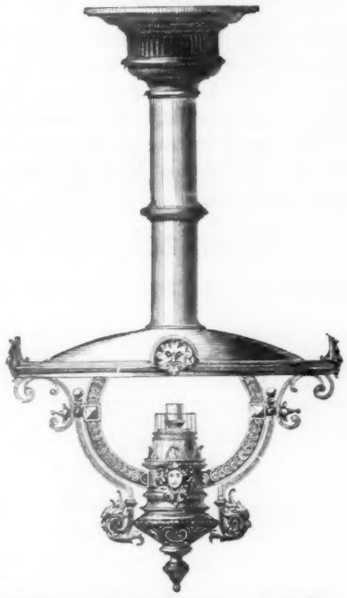
W. D. COLT, - - - - 1420 F Street, Washington, D. C.
JOHN KIEFER, - - - 344 Lawrence, Street, Denver, Col.



THE SIEMENS REGENERATIVE GAS LAMP COMPANY,

SOLE MAKERS FOR THE UNITED STATES,

N. E. Cor. 21st. St. and Washington Av., Philadelphia, Pa.

THE "STANDARD" WASHER-SCRUBBER,

KIRKHAM, HULETT & CHANDLER'S PATENT.

Total Capacity per 24 Hours of "Standard" Washers Ordered During the Following Years.

1877	4,000,000	cubic feet.
1878	4,750,000	"
1879	24,545,000	"
1880	42,967,500	"
1881	36,462,500	"
1882	39,300,000	"
1883	57,735,000	"
1884	26,177,500	"
Total	235,937,500	cubic feet.

Total Number and Capacity per 24 Hours of "Standard" Washers Erected and in Course of Erection in the Several Countries

	Number.	Cubic Feet per Day.
Great Britain	151	157,070,000
Western Hemisphere	38	39,337,500
Australia	18	12,150,000
New Zealand	2	650,000
France	6	4,550,000
Belgium	8	5,420,000
Germany	16	8,200,000
Holland	4	4,160,000
Denmark	1	150,000
Russia	2	3,500,000
Spain	1	350,000
India	1	400,000
Total	248	235,937,500

THE CONTINUED POPULARITY

Of these Machines

Will be recognized from the following extracts from letters from representatives of some of the companies having them in use:

ALLEGHENY GAS WORKS,
ALLEGHENY, PA., Dec. 12, '84.

MR. GEO. SHEPARD PAGE, New York:

Dear Sir—The "Standard" Washer Scrubber is giving us entire satisfaction. At present we are using one gallon water per thousand cubic feet, and the liquor as it leaves the Scrubber is 8 degrees (16 oz.) by Twaddle's hydrometer.

Yours respectfully,
ROBERT YOUNG, Eng'r.

"Standard" Washers Ordered During the Current Year.

	Cu. Ft. per Day
Anneberg Gas Co	200,000
Bombay Gas Co	400,000
Brussels Co	1,250,000
Chemnitz Gas Co	1,000,000
CITIZENS GAS CO., BUFFALO	750,000
Coke Works in Zabre, Ober-Schlesien	1,500,000
Cokerei der Friedenshutte, Upper Silesia	500,000
Dumfries Corporation	250,000
Dunedin Gas Co., New Zealand	400,000
King's Lynn Gas Co	300,000
Leiden, Holland	600,000
Lincoln Gas Co	400,000
Liverpool Gas Co	2,000,000
" "	3,000,000
LOUISVILLE GAS CO	1,500,00
Numea Gas Co	100,00
PITTSBURGH GAS CO	1,500,
PORTLAND GAS CO., Oregon	562,5
SAN FRANCISCO GAS CO	4,000,000
Sheepbridge	40,000
ST. LOUIS GAS CO	2,000,000
Sydney Gas Co	2,500,000
WASHINGTON, D. C. GAS CO	2,000,000
Whitchurch Gas Co	175,000
Total	26,177,500

GEO. SHEPARD PAGE, No. 69 WALL STREET, NEW YORK,

SOLE AGENT FOR THE WESTERN HEMISPHERE.

R. D. WOOD & CO.,

400 Chestnut Street, Phila., Pa.

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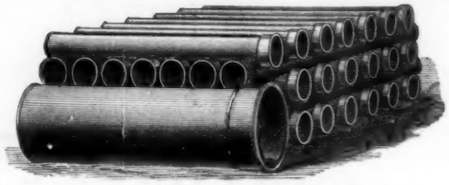

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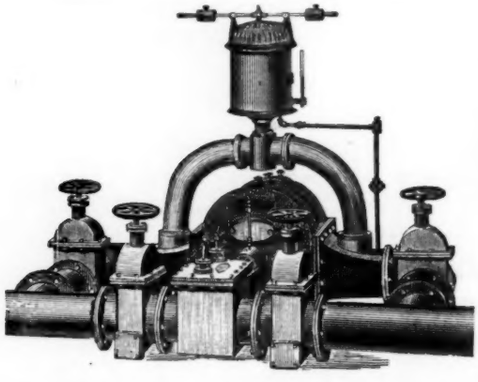

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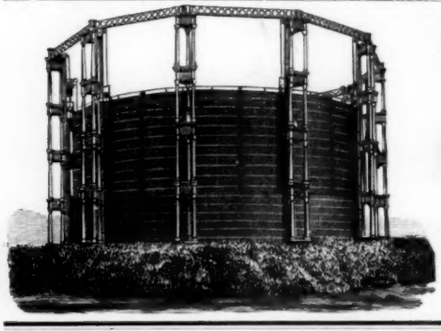

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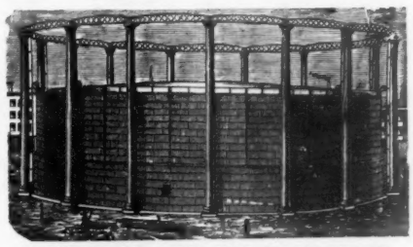

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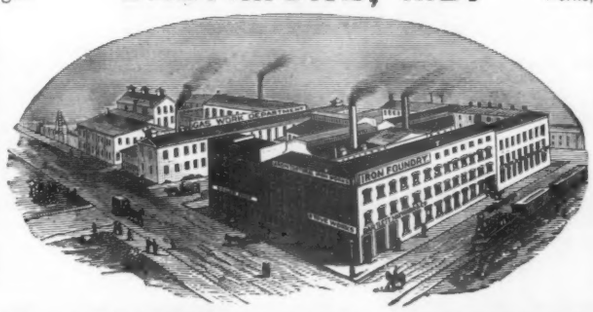

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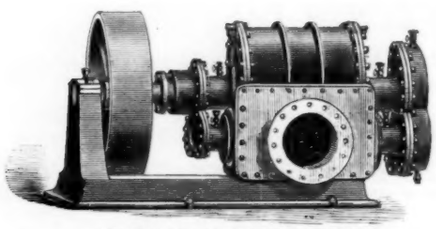

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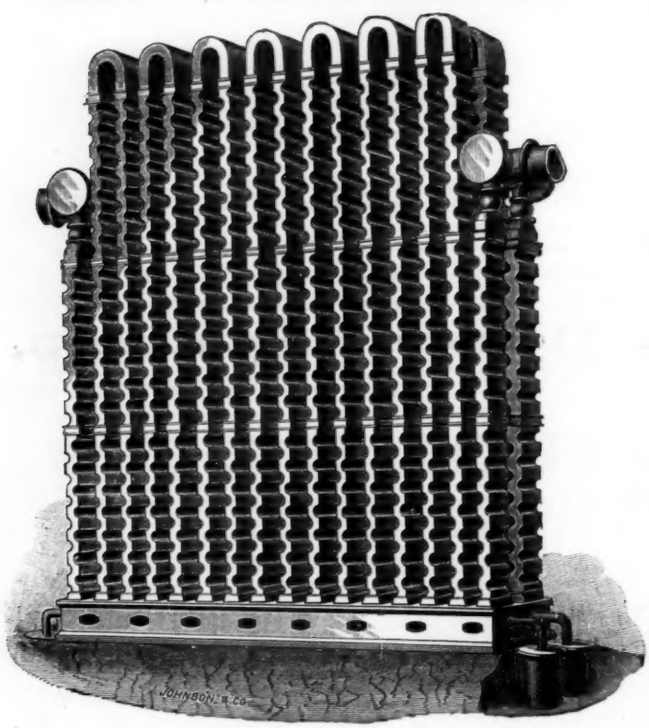

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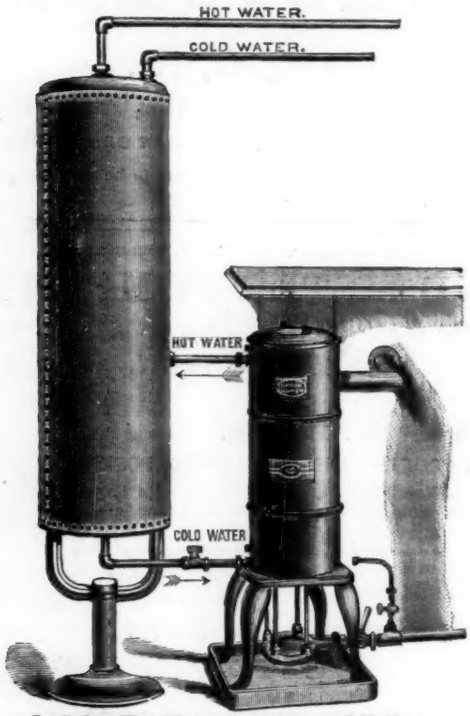

I.—Safety Hot Water Generator and Boiler.

II.—Gas Cooking Stove No. 8 B.

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